

NEW R410A!



StoreMaster™

**Air Handling Unit - Free Cooling,
Cooling & Heat Pump
50 kW - 77 kW**

R410A



TECHNICAL MANUAL



ISO 14001
EMS52086



ISO 9001
FM00542

About Airedale Products & Customer Services

WARRANTY

All AIAC products or parts (non consumable) supplied for installation within the UK mainland and commissioned by an AIAC engineer, carry a full Parts & Labour warranty for a period of 12 months from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.

Parts or Equipment supplied by AIAC for installation within the UK or for Export that are properly commissioned in accordance with AIAC standards and specification, not commissioned by an AIAC engineer; carry a 12 month warranty on non consumable Parts only from the date of commissioning or 18 months from the date of despatch, whichever is the sooner.

Parts or equipment installed or commissioned not to acceptable AIAC standards or specification invalidate all warranty.

Warranty is only valid in the event that

In the period between delivery and commissioning the equipment: is properly protected & serviced as per the AIAC installation & maintenance manual provided where applicable the glycol content is maintained to the correct level.

In the event of a problem being reported and once warranty is confirmed as valid under the given installation and operating conditions, the Company will provide the appropriate warranty coverage (as detailed above) attributable to the rectification of any affected Airedale equipment supplied (excluding costs for any specialist access or lifting equipment that must be ordered by the customer).

Any spare part supplied by Airedale under warranty shall be warranted for the unexpired period of the warranty or 3 months from delivery, whichever period is the longer.

To be read in conjunction with the Airedale Conditions of Sale - Warranty and Warranty Procedure, available upon request.

CAUTION



Warranty cover is not a substitute for maintenance. Warranty cover is conditional to maintenance being carried out in accordance with the recommendations provided during the warranty period. Failure to have the maintenance procedures carried out will invalidate the warranty and any liabilities by Airedale International Air Conditioning Ltd.

SPARES

A spares list for 1, 3 and 5 years will be supplied with every unit and is also available from our Spares department on request.

TRAINING

As well as our comprehensive range of products, Airedale offers a modular range of Refrigeration and Air Conditioning Training courses, for further information please contact Airedale.

CUSTOMER SERVICES

For further assistance, please e-mail: enquiries@airedale.com or telephone:

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General Description

UNIT IDENTIFICATION

		STM	50	R - P
STM	StoreMaster			
50 & 77	Model Size (Expressed as Nominal Cooling in kW)			
R	Cooling			
RHP	Cooling + Heat Pump			
P	Packaged (Evaporator + Condenser Sections)			
E	Evaporator Section			
C	Condenser Section			

INTRODUCTION

The Airedale range of StoreMaster fully packaged air cooled air conditioners covers the nominal capacity range 50kW and 77kW in 2 model sizes.

Attention has been placed on maximising the unit's performance while keeping the sound and footprint to an absolute minimum.

The StoreMaster consists of 2 parts and evaporating section ¹ and a condensing section is offered fully packaged as standard.

In applications where external space is restricted or sound levels are critical, the unit can be supplied optionally as a split system. The Evaporator section can then be mounted internally and piped to an externally mounted Condenser section.

Offering simultaneous DX Mechanical cooling and Free-Cooling operation, the range utilises the latest technology to achieve a high level of energy efficient operation.

CE DIRECTIVE

CE Airedale certify that the equipment detailed in this manual conforms with the following EC Directives:

Electromagnetic Compatibility Directive (EMC)	89/336/EEC
Low Voltage Directive (LVD)	73/23/EEC
Machinery Directive (MD)	89/392/EEC in the version 98/37/EC
Pressure Equipment Directive (PED)	97/23/EC

To comply with these directives appropriate national & harmonised standards have been applied. These are listed on the Declaration of Conformity, supplied with each product.

REFRIGERANT

The range has been designed and optimised for operation with ozone benign refrigerant **R410A**.

¹ Description relates to the heat exchangers function in cooling mode. When operating in heating on the heat pump model the operation of the evaporator and condenser coils is reversed.

FEATURES			COOLING ONLY	COOLING & HEAT PUMP
● Standard	○ Optional Extra	- Not available		
Construction				
Weatherproof Louvre To Fresh Air Intake And Exhaust Air (Packaged Unit Only)			●	●
Fresh Air Free Cooling Economiser - Outside Air Damper			●	●
Split Delivery - Condensing Section And Evaporator Section			○	○
Return Air Fans (AC) - Voltage Regulated Speed Control			●	●
Return Air Fans (AC) - Inverter Speed Control			○	○
Supply Air Fans- Electronically Commutated (EC)			●	●
Constant Supply Air Volume Control			○	○
Return Air Velocity & Volume Measurement			○	○
Filters - 97mm Pleated Disposable BS EN 779-G4			●	●
Condenser				
Condenser Coils - Hydrophilic Coated			●	●
Coil Guards			○	○
Condenser Fans For Head Pressure Modulation - Voltage Regulated Speed Control			●	●
Condenser Fans For Head Pressure Modulation - Inverter Speed Control			○	○
Integrated Maintenance Friendly Drain Pan With Pad Heating			-	●
Refrigeration				
Full Operating Charge Of R410A			●	●
Suction Gas Cooled Tandem Scroll Compressor With Internal Motor Protection, Pressure Relief, & Sump Heater			●	-
Suction Gas Cooled Scroll Compressor With Internal Motor Protection, Pressure Relief, Oil Sight Glass & Sump Heater			-	●
Number Of Independent Refrigeration Circuits			1	2
Electronic Expansion Valve (EEV) - Evaporator			●	●
Thermostatic Expansion Valve (TEV) - Condenser			-	●
Liquid Line Sight Glass			●	●
Liquid Line Ball Valves			●	●
Liquid Receiver			-	●
Discharge Line Ball Valves			●	●
4 Way Reversing Valve			-	●
Suction Accumulator			-	●
Non-Return Valve			-	●
Manual Reset HP/LP Switch (LP Via Microprocessor)			●	●
Suction And Liquid Pressure Transducers			●	●
Leak Detection System			○	○
Heating				
Indirect Gas Fired Heating			○	○
Electric Heating			○	○
Low Pressure Hot Water			○	-
Electrical				
Emergency Stop			●	●
Interlocking Mains Door Isolator			●	●
Fan Speed Controllers And Valve Drivers			●	●
Electronic Soft Start			○	○
Maintenance Friendly 13A Double 3 Pin Plug Socket			○	○
Phase Monitoring & Protection			○	○
Controls				
AIRETronix Microprocessor Controller			●	●
Remote Display			○	○
Inverter Drive Interface Display			○	○
Enthalpy Controls			○	○
Energy Manager			○	○
Air Quality Monitoring			○	○
BMS Interface Card			○	○

General Description

STANDARD FEATURES - GENERAL

Construction	<p>The base is fabricated from galvanised steel to ensure a tough, durable, weatherproof construction.</p> <p>Unit support can be provided by concrete/steel pillars to each corner of the rigid steel base.</p> <p>The superstructure is manufactured from galvanised sheet steel coated with epoxy baked powder paint to provide a durable and weatherproof finish.</p> <p>Standard unit colour is Light Grey (RAL 7035).</p> <p>Compressors are mounted on a rigid galvanised heavy-duty sub frame. Fully weatherproofed electrical panels are situated at one side of the unit. Access to all major components sections of the unit are via either hinged or removable panels.</p> <p>Construction includes duct flanges/mounts to accept self support ducting of up to 4m.</p> <p>A set of removable 4 M24 collared lifting eye bolts to BS4278 are supplied.</p> <p>Refer to Dimensional Data, on page 41 for unit layout.</p>
Weather Louvres - Packaged	<p>A weatherproof louvre is fitted to the fresh air intake and exhaust air as standard, to protect internal components, complete with bird mesh.</p> <p>Refer to Weather Louvres - Split System, on page 14 , for split system louvre arrangement.</p>
Refrigeration	<p>As standard the packaged unit is supplied with a full operating charge of R410A refrigerant.</p> <p>As standard the split unit is supplied with sufficient charge of R410A refrigerant to cover 5m of interconnecting pipe work. Refer to Split Delivery, on page 13 for split case arrangement.</p> <p>The cooling only unit has a single refrigeration circuit.</p> <p>The Heat Pump unit has a two independent refrigeration circuits.</p> <p>For further details, refer to System Pipework Schematic, on page 20.</p>
Cooling Only Unit	<p>EVAPORATOR SECTION INCLUDES:</p> <ul style="list-style-type: none">• Electronic expansion valve (EEV)• Liquid line sight glass• Discharge line ball valve• Large capacity filter drier• Low pressure switch with manual reset via microprocessor controller• High pressure switch with manual reset• Suction and liquid pressure transducers <p>CONDENSING SECTION INCLUDES:</p> <ul style="list-style-type: none">• Liquid line ball valve• 5/16" Schrader for gauge connection

General Description

STANDARD FEATURES - GENERAL - ENERGY SAVING



Refrigeration

Heat Pump Unit

EVAPORATOR SECTION INCLUDES:

- Electronic expansion valve (EEV)
- Liquid line sight glass
- Discharge line ball valve
- Large capacity filter drier
- Low pressure switch with manual reset via microprocessor controller
- High pressure switch with manual reset
- Suction and liquid pressure transducers
- Liquid Receiver
- 4 Way Reversing Valve
- Suction Accumulator
- Non-return valve

CONDENSING SECTION INCLUDES:

- Thermostatic expansion valve (TEV) with external equaliser
- Liquid line ball valve
- Non-return valve
- 5/16" Schrader for gauge connection
- Solenoid valve

General Description

STANDARD FEATURES - EVAPORATOR SECTION

Coil	<p>Large surface area coil(s) ideally positioned to optimise airflow and heat transfer, manufactured from refrigeration quality copper cross hatched tubes with mechanically bonded aluminium fins.</p> <p>Coils are suitably positioned over a purpose made stainless steel drain tray.</p> <p>Fins are coated with a non-stick acrylic film (hydrophilic) which provides additional corrosion protection and efficient surface water removal for improved performance.</p>
Cooling Only Unit	Single circuit.
Heat Pump Unit	Dual interlaced circuits optimised for heat pump application.
Fan & Motor Assembly - Supply Air Fan	<p>Electronically Commutated (EC) Fan Motor</p> <p>Direct driven backward curved impeller plug fans with integrated 3-phase EC external rotor motors are situated in an attenuated scroll housing that reduces discharge air and case break out sound levels.</p> <p>The high performance impeller is dynamically balanced with inlet ring to provide energy cost savings due to the high efficiency of the assembly.</p> <p>Fan speed, airflow and external static pressure are adjusted via the microprocessor display which maintains optimum performance and offers easy on site adjustment.</p> <p>For further details, please refer to <i>Design Features & Information</i>, on page 18.</p> <p>An optional return air fan is available; refer to <i>Return Air Fan</i>, on page 14.</p>
Filters	<p>97mm pleated disposable panel filters in a rigid frame. Conform to BS EN 779-G4. Access and removal from unit side.</p> <p>An adjustable diaphragm pressure switch is fitted across the filter assembly to monitor pressure drop which will initiate a filter dirty alarm.</p> <p>On sites with high debris levels, it is recommended that an additional set of filters be purchased for post commissioning operation, <i>please specify at order.</i></p>

General Description

STANDARD FEATURES - EVAPORATOR SECTION

Compressor	<p>Suction gas cooled scroll compressors comprising:</p> <ul style="list-style-type: none"> • Internal motor protection • Internal pressure relief • Non return valve • External discharge temperature protection • Oil sight glass • Oil heater <p>The compressors are mounted to the rigid galvanised heavy duty sub-frame with the use of vibration reducing isolation.</p>
Cooling Only Unit	<p>Single Tandem set on 1 circuit to provide 2 cooling stages.</p> <p>Tandem pairs have an oil equalisation line.</p>
Heat Pump Unit	<p>Single compressor to each circuit to provide 2 cooling stages and 2 heating stages.</p>
Head Pressure Control - Intelligent Modulation	<p>As standard the system is fitted with a voltage regulating fan speed controller which allows set-point adjustment and system monitoring via the AIRETronix microprocessor controller.</p> <p>A pressure transducer is fitted to the liquid line which in turn feeds back the head pressure to the microprocessor.</p> <p>The head pressure can be monitored via the display keypad.</p>
Cooling Mode	<p>The outdoor fan speed can then modulate via the controller to provide optimum control under varying ambient conditions.</p> <p>With the head pressure factory set to 22 Barg (319 psig) part load, EER values are significantly improved, which in turn lowers energy consumption.</p>
Heat Pump Mode	<p>The outdoor fan speed can then modulate via the controller to provide optimum control under varying ambient conditions.</p> <p>With the head pressure factory set to 35 Barg (508 psig) part load, EER values are significantly improved, which in turn lowers energy consumption.</p> <p>In heating mode head pressure is adjusted by regulating the evaporating pressure with the outdoor axial fans.</p>
Main Electric Isolator	<p>To ensure complete unit isolation of the electrical panel during adjustment and maintenance a door interlocking isolator is provided as standard.</p>

General Description


STANDARD FEATURES - EVAPORATOR SECTION

Electrical

Dedicated weatherproof electrical power and controls panels are situated at the side of the unit and contain:

- Door locking electrical isolation for mains compartment
- Separate, fully accessible, controls compartment, allowing adjustment of control set points whilst the unit is operational
- Circuit breakers for protection of all major unit components
- Fan speed controllers and valve drivers

The electrical power and control panel is wired to the latest European standards and codes of practice.

CAUTION  **A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.**

Controls

Units are fitted with the **AIRE**Tronix microprocessor controller which offers powerful analogue and digital control to meet a wide range of monitoring and control features including a real time clock and a communication port plus networking and BMS connections.

A keypad/display assembly is used to view the unit status and allow operator adjustment.

For full details, please refer to the **Controls**, on page 25.

General Description

STANDARD FEATURES - EVAPORATOR SECTION - ENERGY SAVING



Expansion Valves

Cooling Only Unit

IN COOLING MODE, ELECTRONIC EXPANSION VALVES (EEV):

Electronic expansion valves differ to the normal thermostatic expansion valves in their ability to maintain control of the suction superheat at reduced head pressures.

EEV step position, superheat setpoint, head pressure set point and other features can be viewed and adjusted via the microprocessor display keypad.

Factory fitted, for full details refer to *Design Features & Information*.

Heat Pump Unit

IN COOLING MODE, ELECTRONIC EXPANSION VALVES (EEV):

Electronic expansion valves differ to the normal thermostatic expansion valves in their ability to maintain control of the suction superheat at reduced head pressures.

EEV step position, superheat setpoint, head pressure set point and other features can be viewed and adjusted via the microprocessor display keypad.

Factory fitted, for full details refer to *Design Features & Information*.

IN HEAT PUMP HEATING MODE THERMOSTATIC EXPANSION VALVES (TEV):

Factory fitted, for full details refer to *Design Features & Information*.

Free Cooling Economiser Facilitates free cooling operation.

Consists of motorised opposed blade aluminium dampers, fitted to each Evaporator section as standard. There are 3 dampers of equal size per unit; fresh air, exhaust air and mixed air. The dampers have been designed to allow for 100% free cooling operation using the full design air volume.



General Description

STANDARD FEATURES - CONDENSER SECTION

Coil	<p>Large surface area coil(s) ideally positioned to optimise airflow and heat transfer, manufactured from refrigeration quality copper cross hatched tubes with mechanically bonded aluminium fins.</p> <p>Fins are coated with a non-stick acrylic film (hydrophilic) which provides additional corrosion protection and efficient surface water removal for improved performance.</p>
Cooling Only Unit	As above.
Heat Pump Unit	As above. Full width pull-out condensate tray with drain stub and pad heating.
Fan & Motor Assembly	<p>Sickle bladed axial flow fan assemblies with integral long bellmouth and fingerproof grille; and incorporating external rotor ac motor technology, to provide highly accurate speed control.</p> <p>Air is discharged vertically.</p> <p>The fans offer maximum performance while keeping sound levels to a minimum.</p> <p>Each fan is speed controllable and operates from a 3 phase electrical supply.</p> <p>Optionally, speed control can be provided by energy efficiency inverter drives, refer to <i>Inverter Driven Axial Fans - Condenser & Return Air Fan Section</i>, on page 16.</p>

General Description

OPTIONAL EXTRAS - GENERAL

Split Delivery The evaporator section and condensing section can be delivered as a split system.

Cooling Only Unit

EVAPORATOR SECTION INCLUDES:

- Holding Charge of Inert Gas
- Sub Fusing for Condenser
- Interconnecting sweat copper pipe connections
- Shut Off Ball Valves

CONDENSING SECTION INCLUDES:

- Precharged with R410A for approximately 5m of interconnecting pipework
- Door Interlocking Isolator
- Shut Off Ball Valves
- Interconnecting sweat copper pipe connections

Heat Pump Unit

EVAPORATOR SECTION INCLUDES:

- Precharged with R410A
- Sub Fusing for Condenser
- Interconnecting sweat copper pipe connections
- Shut Off Ball Valves

CONDENSING SECTION INCLUDES:

- Precharged with R410A for approximately 5m of interconnecting pipework
- Door Interlocking Isolator
- Interconnecting sweat copper pipe connections
- Shut Off Ball Valves

The refrigeration pipework for split heat pump applications is based on a 3 pipe system. A 3 pipe system relies on the following refrigeration pipes between indoor and outdoor sections

- 1 Liquid feed to TEV for evaporator coil in heat pump mode **or**,
Liquid feed to EEV for evaporator coil in cooling mode
- 2 Suction from evaporator coil in heat pump mode
- 3 Discharge from compressor in cooling mode

General Description

OPTIONAL EXTRAS - GENERAL

Coil Guards	Guards can be fitted to each of the outer condenser coils to protect against damage.
Electronic Soft Start	The electronic soft start enables the unit compressor motor to be ramped to speed with the minimum full load current. Further benefits include removal of nuisance tripping, supply voltage dips and motor overheating.
Emergency Stop	Can be factory fitted to the electrical control panel of the evaporator section.
Return Air Fan	<p>Direct driven speed controllable short case axial fan with efficient 3 phase rotor motor technology and finger guard grilles. Factory fitted and located below the return air duct aperture to ensure re-circulation of air in the conditioned space and powered exhaust air during free cooling operation.</p> <p>The system is fitted with a voltage regulating fan speed controller which allows set-point adjustment and system monitoring via the AIRETronix microprocessor controller.</p> <p>Optionally, speed control can be provided by energy efficiency inverter drives, refer to <i>Inverter Driven Axial Fans - Condenser & Return Air Fan Section</i>, on page 16.</p>
Constant Air Volume	Design to maintain system air volumes regardless of system pressure drops, in particular where there is increased resistance due to dirty filters. In addition, commissioning set up times are reduced. Operating air volume can be viewed via the microprocessor display/keypad.
Supply Air Fan	<p>Supply air fan speed can be modulated to maintain a constant air volume by the differential pressure between the case and fan inlet ring being monitored via the unit microprocessor.</p> <p>The control signal to the supply air fans is automatically adjusted to maintain design unit air volume.</p>
Air Volume Adjustment	Designed to facilitate on site adjustment of the return air volume. In addition, commissioning set up times are reduced. Operating air volume can be viewed via the microprocessor display/keypad.
Return Air Fan	Return air fan speed can be manually adjusted to maintain a constant air volume via the unit microprocessor by the fitting of a velocity sensor in the return air duct, supplied loose for on site fitment.
Weather Louvres - Split System	<p>A weatherproof louvre is recommended for fitting to outdoor units with fresh air intake and exhaust air, to protect internal components.</p> <p>Complete with bird mesh.</p>
R410A Leak Detection System	A factory calibrated and fitted leak detection system fitted in the compressor section, will raise an alarm when refrigerant gas is detected.


General Description

OPTIONAL EXTRAS - GENERAL

Maintenance 13A Socket Double 13A three pin plug socket for unit maintenance only.

Heating Options

Electric Heating Multi-stage finned electric heating elements complete with auto and manual reset overheat cut-out protection, phase balanced for increased efficiency.

IMPORTANT  **A separate mains incoming power supply is required with the electric heating option.**

or

Low Pressure Hot Water (Cooling Only Units) A low pressure hot water coil constructed of refrigeration quality copper tube and mechanically bonded aluminium fins can be factory fitted.
Frost protection is fitted to prevent freezing of the low pressure hot water coil assembly.
Proportional heating control is provided by a factory fitted 3 port modulating valve.
A bypass balancing valve is fitted to aid commissioning and unit operation by creating the same pressure drop through the bypass as through the LPHW coil.

Phase Monitoring Relay A phase monitoring relay can be fitted; this offers protection for phase rotation, loss of phase plus under and over voltage control.

Phase Rotation Protection A phase sequence relay is available for units containing 3 phase scroll compressors, to prevent possible damage by running the compressor in the wrong direction.

Enthalpy Controls The **AIRE**Tronix microprocessor can be programmed to calculate enthalpy values from the combined temperature and humidity sensors fitted within each unit measuring return air and ambient air conditions.
Enthalpy sensors will allow the microprocessor control to prevent high humidity fresh air conditions entering the conditioned space.

Energy Manager Analysis of system energy consumption can be monitored via a dedicated LCD display. Unit parameters can be adjusted via the unit microprocessor control to affect energy usage in line with the system needs. With the optional interface card fitted all information from the energy manager can be monitored from a BMS.

Air Quality Monitoring The main gases detected are, for what concerns the volatile organic compounds (VOC), a mixture of the following gases; carbon monoxide CO₂, sulphur water H²S, solvent vapours, alkane vapours, cigarette smoke, car exhaust, air produced by human breathing, combustion smoke from wood, paper and plastics. Additionally, the problem detects the concentration of CO₂ from 350 up to 200 ppm.
The VOC mixture is displayed as a % from 0 - 100% via the microprocessor keypad display.

General Description

OPTIONAL EXTRAS - ENERGY SAVING



Inverter Driven Axial Fans - Condenser & Return Air Fan Section

ECA Approved

Inverter powered, variable frequency drives are fitted for optimum efficiency and control of fan speed, maintaining a constant condensing pressure, allowing the system to operate satisfactorily in ambient temperatures as low as -20°C, with minimal fan input power.

Heating Options

Indirect Gas Fired Heating

ECA Approved

Factory installed indirect gas fired sealed combustion tubular heater with 2 stage ON / OFF control as standard.

The split system Evaporator section is suitable for both externally and internally located unit applications. For sealed plant room applications please refer to Airedale.

IMPORTANT



Configured as standard suitable for outdoor application only, UNLESS otherwise stated at time of order.

The 90kW tubular gas burner is constructed from aluminised steel, each tube having rippled bends creating turbulence of combustion within, offering optimum efficiency.

The burner assembly consists of a series of injectors. The gas-air mixture, prepared in the burners, enables excellent combustion within the heat exchanger tubes. Ignition of the combustible mixture is ensured by an electronic ignition system and the burner is fitted with a blow back switch, an ignition detection sensor and a flame detection sensor. The complete unit can be easily removed for servicing or inspection, should it be necessary.

Gas isolation valve(s) must be supplied by others.

The units are designed and tested in accordance with the current European CE Standards.

Design Features & Information

ENERGY SAVING FEATURES

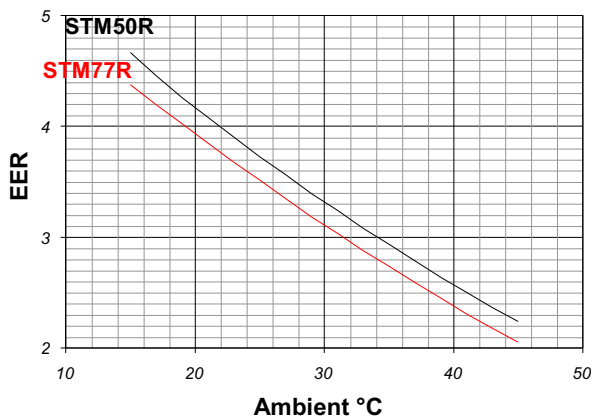


Free Cooling

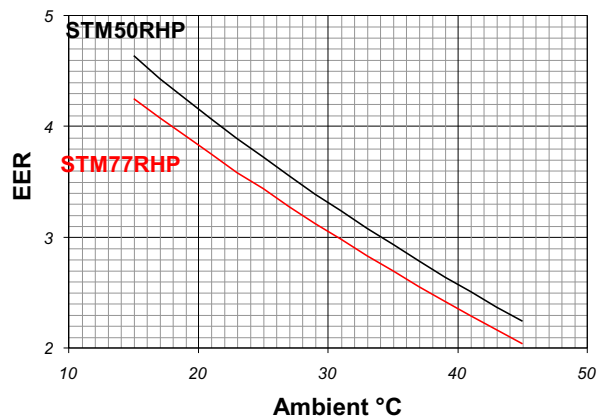
The StoreMaster packaged unit has been designed to provide the cooling load required whilst optimising energy efficiency **at all times** and as such will take advantage of free cooling whenever available. If the free cooling available cannot satisfy the required full cooling load, DX (mechanical) cooling is used to supplement the output.

DX (Mechanical) Cooling

Cooling Only Unit



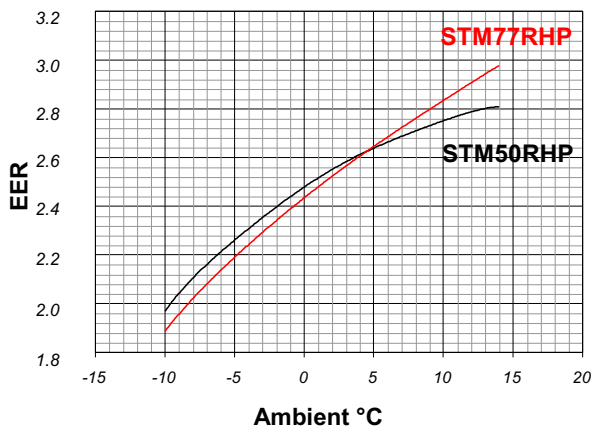
Cooling & Heat Pump Unit



- 1 Energy Efficiency Ratio (EER) is Unit Output Duty ÷ Unit Input Power.
- 2 Figures quoted at Room Conditions of 24°C / 50% RH Gross.

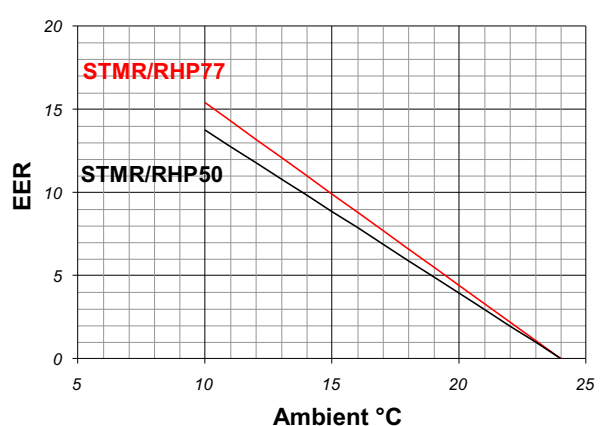
DX (Mechanical) Heating

Cooling & Heat Pump Unit



Free Cooling

Cooling & Heat Pump Unit



- 1 Energy Efficiency Ratio (EER) is Unit Output Duty ÷ Unit Input Power.
- 2 Figures quoted at Room Conditions of 24°C / 50% RH Nett.

Design Features & Information

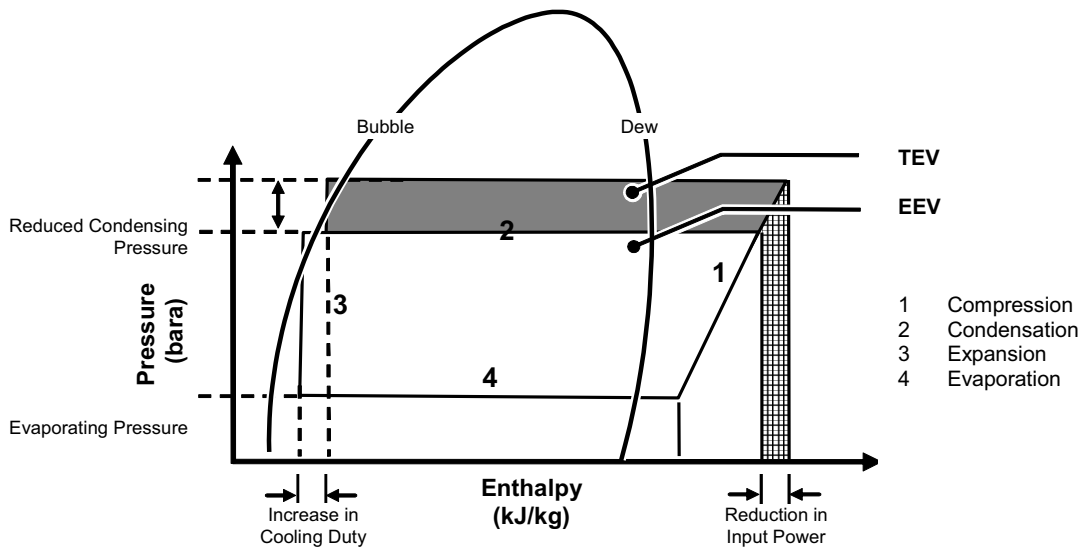
ENERGY SAVING FEATURES



Electronic Expansion Valves (EEV)

Using an EEV allows for good refrigeration control whilst operating at part load and lower ambient conditions with a reduced condensing pressure. By fitting an EEV and adjusting the head pressure control setting **an increase in the system EER (Energy Efficiency Ratio) of up to 30% can typically be seen.** The Mollier diagram shown below helps to illustrate how this increase in efficiency is achieved.

EEV's differ to normal thermostatic expansion valves in their ability to maintain control of refrigerant flow and the suction superheat at reduced head pressures. The turn-down rate of a typical EEV is superior to that of its thermostatic equivalent, such that a reduced optimum condensing pressure can be maintained at low compressor load. However low the load is on the compressor, from zero to 100%, there will not be a problem with turn down, even down to 10% of the valve's rated capacity.



Key: Cooling Cycle @ 22°C ambient with a conventional TEV fitted.
 Cooling cycle @ 22°C ambient, demonstrating a typical EEV condensing temperature taking full advantage of lower ambient air temperatures (below 30°C).

Electronically Commutated (EC) Fan Motor Option

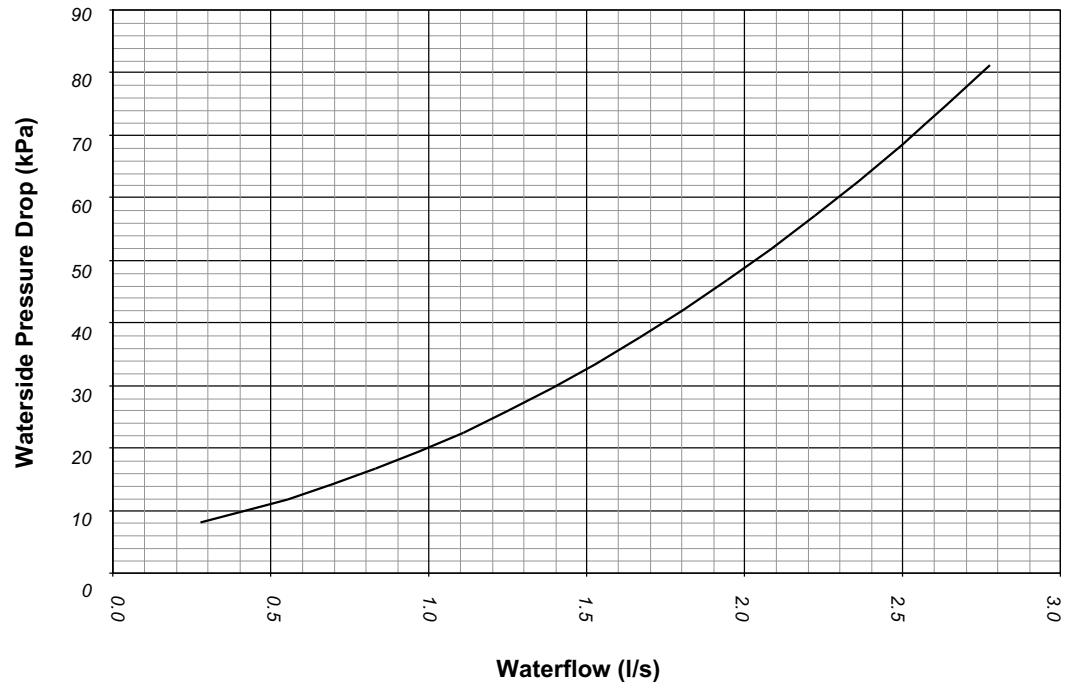
EC motors are DC motors with integrated AC to DC conversion; this gives the flexibility of connecting to AC mains with the efficiency and simple speed control of a DC motor. The EC fan offers significant power reduction in comparison with equivalent AC fan at both full and modulated fan speeds. The inbuilt EC fan control module allows for fan speed modulation from 20-100%, a standard AC fans modulating range is typically 40-100% of full fan speed.

The EC fan offers superior energy efficiency at full and reduced fan speed compared to the equivalent ac fan motor.

Design Features & Information

LOW PRESSURE HOT WATER (OPTIONAL EXTRA)

Cooling Only

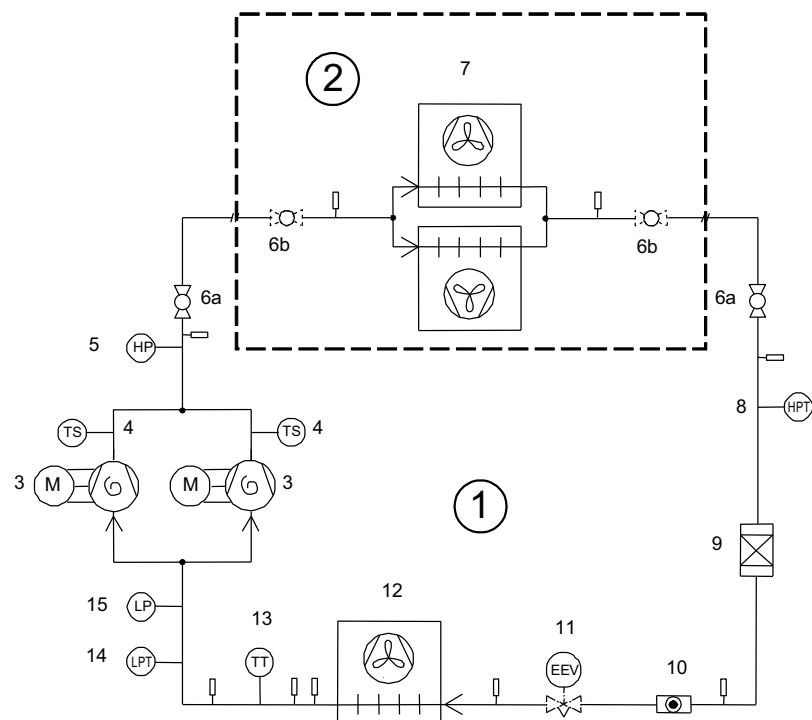


1 Includes valve and pipework.

Design Features & Information

SYSTEM PIPEWORK SCHEMATIC

Cooling Only

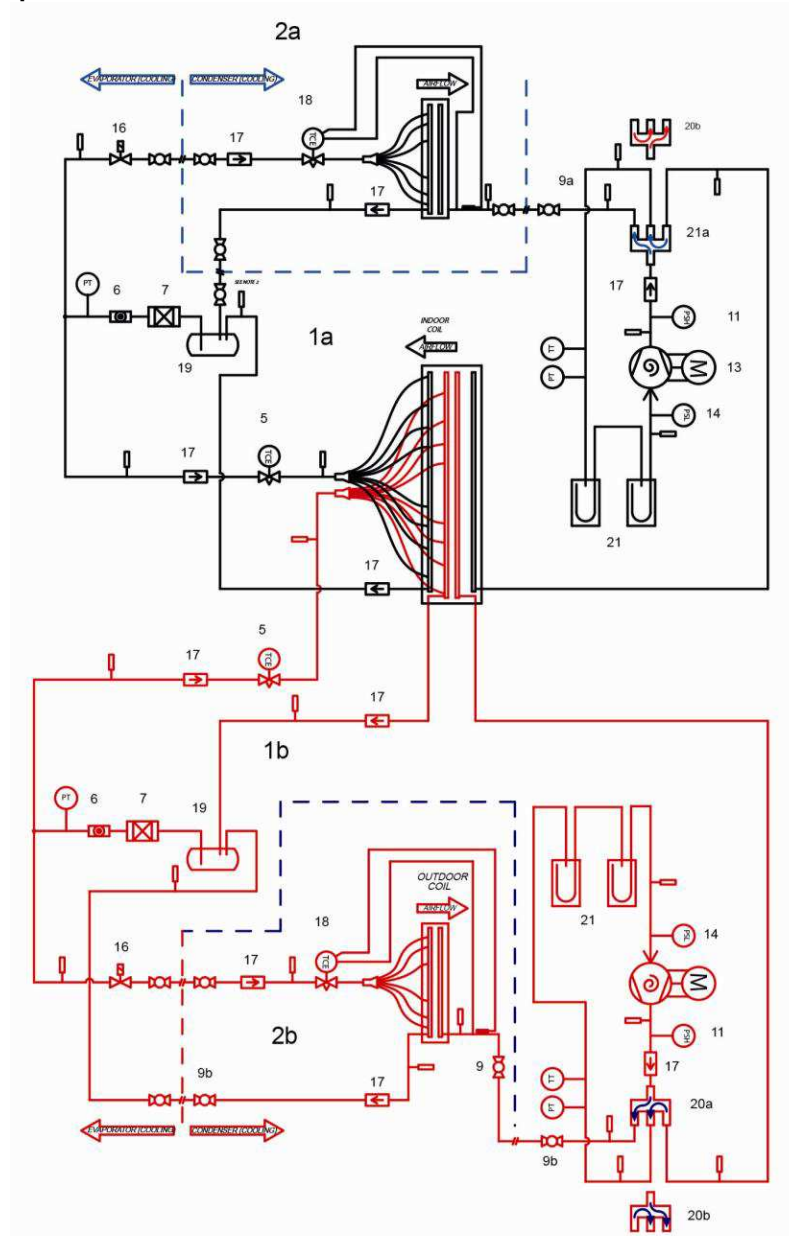


- 1 Evaporator Section (refer to **Footnote 1**, on page 4)
- 2 Condenser Section (refer to **Footnote 1**, on page 4)
- 3 Scroll Compressor - Tandem Set
- 4 Temperature Sensor
- 5 High Pressure Switch
- 6a Ball Valve
- 6b Ball Valve - Split Delivery Only
- 7 Condenser Section Coil & Fan
- 8 Head Pressure Transducer
- 9 Filter Drier
- 10 Sight Glass
- 11 Electronic Expansion valve (EEV)
- 12 Evaporator Section Coil & Fan
- 13 Temperature Transmitter
- 14 Low Pressure Transducer
- 15 Low Pressure Switch

Design Features & Information

SYSTEM PIPEWORK SCHEMATIC

Cooling & Heat Pump Unit 50RHP



- 1a Evaporator Section in Cooling Mode
- 1b Evaporator Section in Heat Pump Mode
- 2a Condenser Section in Cooling Mode
- 2b Condenser Section in Heat Pump Mode

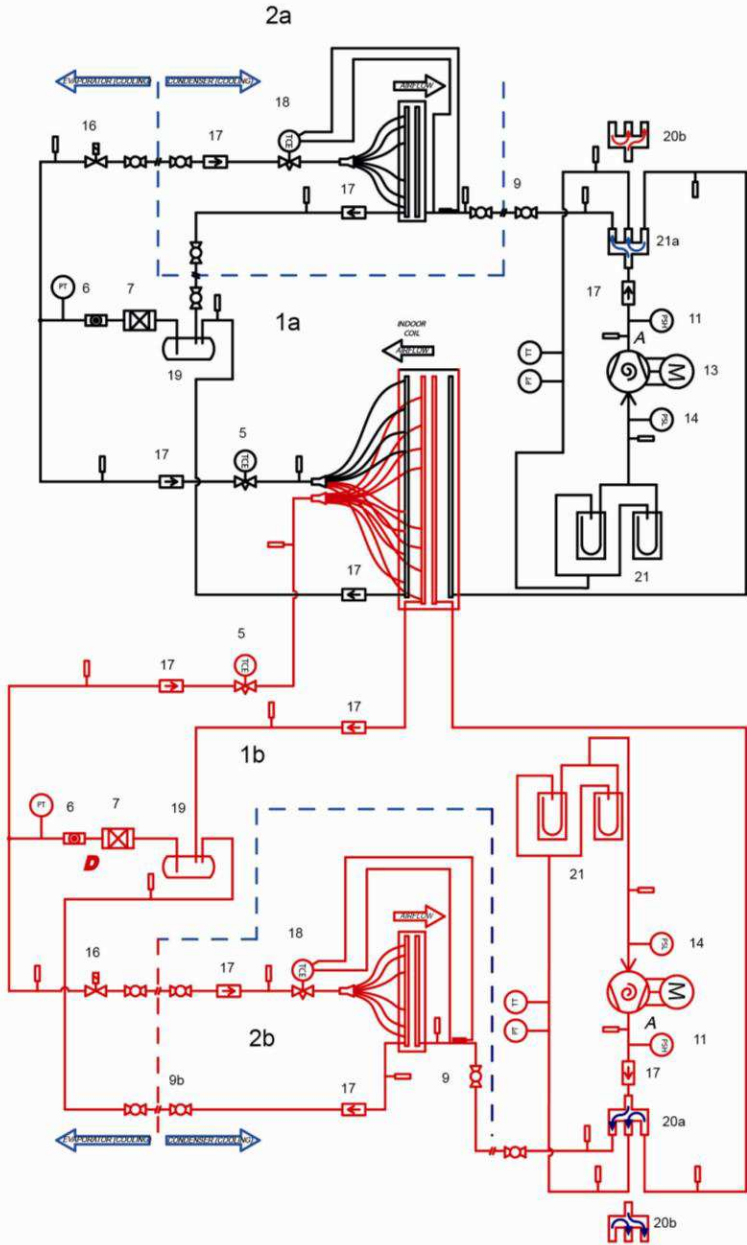
(refer to **Footnote 1**, on page 4)

- 4 Interlaced Evaporator Section Coil and airflow direction
- 5 Electronic Expansion valve (EEV)
- 6 Sight Glass
- 7 Filter Drier
- 9a Ball Valve
- 9b Ball Valve - Split Delivery Only
- 10 Condenser Section Coil and airflow direction

- 11 High Pressure Switch
- 13 Scroll Compressor - Tandem Set
- 14 Low Pressure Switch
- 16 Solenoid Valve
- 17 Check Valve
- 18 Thermostatic Expansion Valve (TEV)
- 19 Liquid Receiver
- 20a Reversing Valve in Cooling Mode
- 20b Reversing Valve in Heat Pump Mode
- 21 Accumulators

Design Features & Information

SYSTEM PIPEWORK SCHEMATIC
Cooling & Heat Pump Unit 77RHP



- 1a Evaporator Section in Cooling Mode
- 1b Evaporator Section in Heat Pump Mode
- 2a Condenser Section in Cooling Mode
- 2b Condenser Section in Heat Pump Mode

(refer to **Footnote 1**, on page 4)

- 4 Interlaced Evaporator Section Coil and airflow direction
- 5 Electronic Expansion valve (EEV)
- 6 Sight Glass
- 7 Filter Drier
- 9a Ball Valve
- 9b Ball Valve - Split Delivery Only
- 10 Condenser Section Coil and airflow direction

- 11 High Pressure Switch
- 13 Scroll Compressor - Tandem Set
- 14 Low Pressure Switch
- 16 Solenoid Valve
- 17 Check Valve
- 18 Thermostatic Expansion Valve (TEV)
- 19 Liquid Receiver
- 20a Reversing Valve in Cooling Mode
- 20b Reversing Valve in Heat Pump Mode
- 21 Accumulators

AIRETronix Controls

GENERAL DESCRIPTION

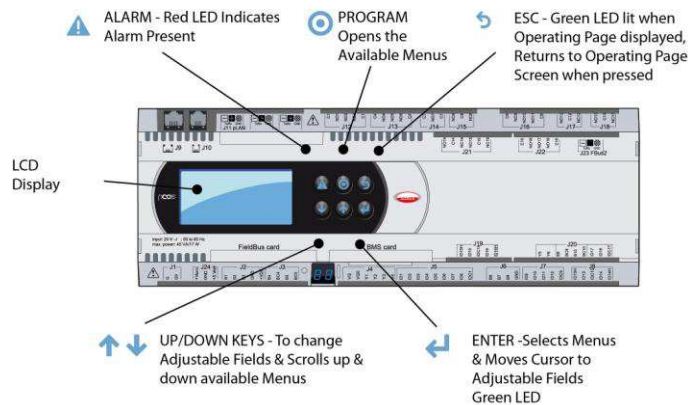
The microprocessor controller offers powerful analogue and digital control to meet a wide range of monitoring and control features including a real time clock and Industry standard communication port and network connections.

The controller's inbuilt display is used for viewing the unit operating status and making adjustments to control parameters by allowing the operator access to a series of display pages.

Optionally a remote mounted display keypad is available; refer to **Optional Features**, on page 28.

Also featured are a visual alarm and the facility to adjust and display control settings by local operator for information and control.

Display/ keypad



- 1 UP/DOWN KEYS - To change Adjustable Fields & Scrolls up & down available Menus
- 2 ENTER -Selects Menus & Moves Cursor to Adjustable Fields Green LED
- 3 ESC - Green LED lit when Operating Page displayed, Returns to Operating Page Screen when pressed
- 4 PROGRAM - Opens the Available Menus
- 5 ALARM - Red LED Indicates Alarm Present
- 6 4 ROW LCD DISPLAY
- 7 CURSOR (FLASHING) Top Left Position = "HOME" Indicates adjustable Fields

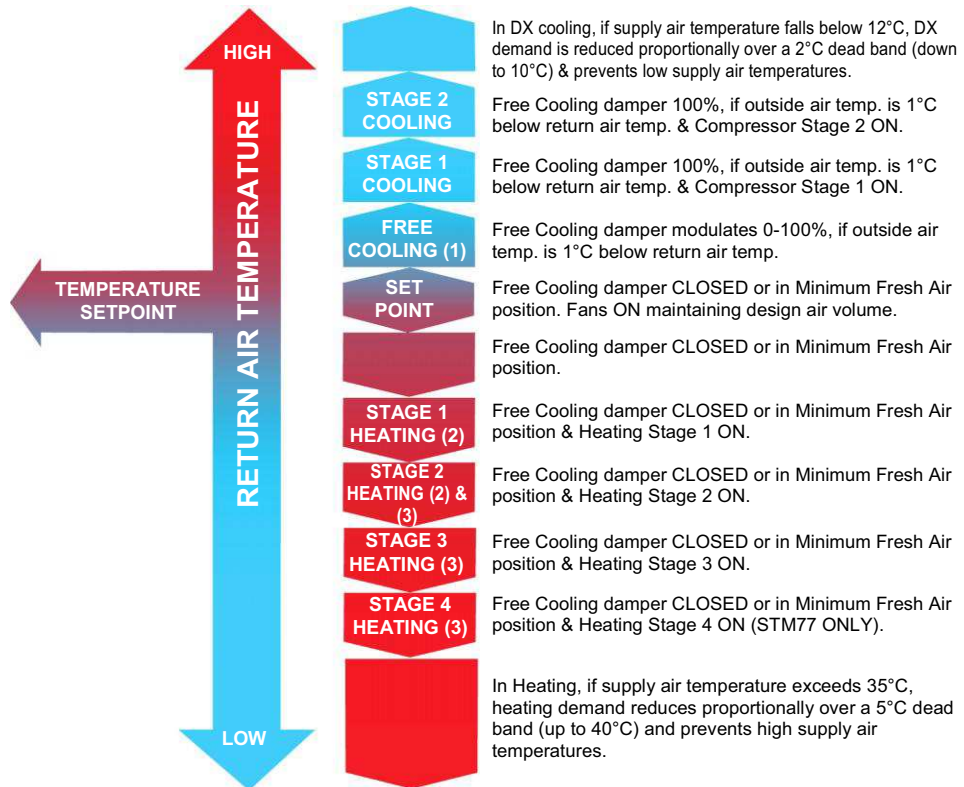
TEMPERATURE CONTROL

The unit has been designed to provide the cooling load required whilst optimising energy efficiency **at all times** and as such will take advantage of **free cooling** whenever available. If the free cooling available cannot satisfy the required full cooling load, DX (mechanical) cooling is used to supplement the output.

The **AIRETronix** microprocessor maintains the return air temperature set-point temperature by sensing the return and outdoor air temperatures. The Economiser damper positions are modulated as necessary to optimise fresh air free cooling operation.

AIRETronix Controls

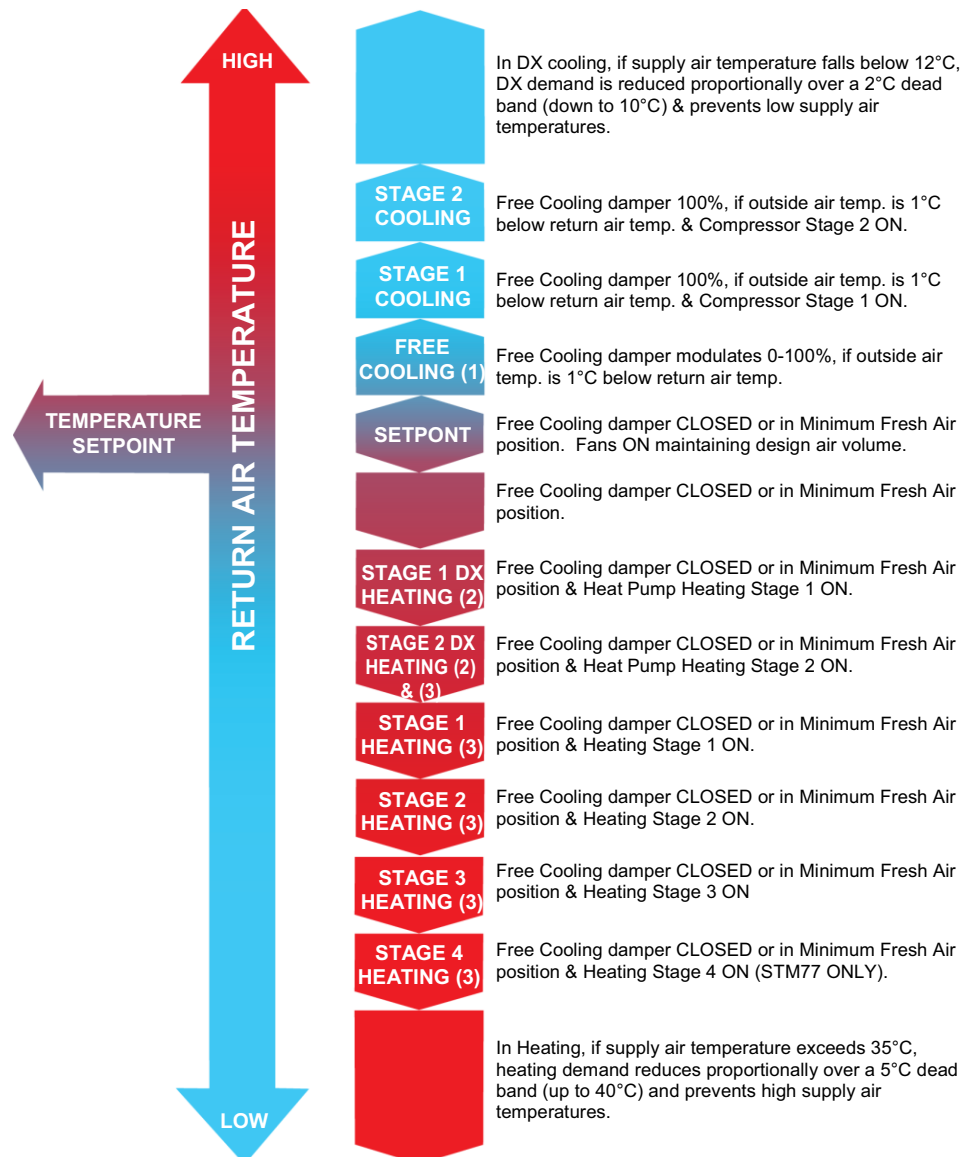
**OPERATION
COOLING ONLY**



- (1) In Free Cooling, if Supply Air Temperature falls below 10°C, Free Cooling demand reduces proportionally over a 1°C dead band (down to 9°C) & prevents low supply air temperatures.
- (2) In Heating operation, if temperature difference between return air and outside air is greater than 10°C, Free Cooling damper CLOSSES PERIODICALLY to prevent low outside temperatures effecting the heating performance and control of the room temperature.
- (3) Heating Options:
 - Gas Heating offers 2 Stages of Heating or;
 - LPHW Heating is 1 stage 0-100% modulating or;
 - Electric Heating option offers up to:
 - 3 Stages of Heating (STM50)/
 - 4 Stages of Heating (STM77)

AIRETronix Controls

OPERATION COOLING & HEAT PUMP



- (1) In Free Cooling, if Supply Air Temperature falls below 10°C, Free Cooling demand reduces proportionally over a 1°C dead band (down to 9°C) & prevents low supply air temperatures.
- (2) In Heating operation, if temperature difference between return air and outside air is greater than 10°C, Free Cooling damper CLOSES PERIODICALLY to prevent low outside temperatures effecting the heating performance and control of the room temperature.
- (3) Heating Options:
 - Gas Heating offers 2 Stages of Heating or;
 - Electric Heating option offers up to:
 - 3 Stages of Heating (STM50)/
 - 4 Stages of Heating (STM77)

Factory Settings

The control strategy has been programmed with the following default settings:

Temperature Setpoint	= 20.0°C	Cooling Band = 3°C
Temperature Dead band	= 2°C	Heating Band = 3°C
Free Cooling Band	= 1°C	

AIRETronix Controls

MONITORING

The microprocessor also monitors and displays the following measured parameters:

- Return Air Humidity (Enthalpy Option Only)
- Supply Fan Differential Air Pressure (Constant Air Volume Option Only)
- Condensing Pressure
- Return Air Temperature
- Supply Air Temperature
- Outdoor Air Temperature
- Outdoor Air Humidity (Enthalpy Option Only)
- Circuit 1 Suction Line Temperature
- Circuit 2 Suction Line Temperature
- Circuit 1 Suction Line Pressure
- Circuit 2 Suction Line Pressure
- Circuit 1 Evaporator Superheat
- Circuit 2 Evaporator Superheat
- Circuit 1 Outdoor Coil Temperature (Heat Pump Only)
- Circuit 2 Outdoor Coil Temperature (Heat Pump Only)
- Air Quality Sensor Or CO2 Sensor
- Electrical Power Measurement (Energy Manager Option Only)

ALARM HANDLING

The following conditions will be detected, triggering a visual display:

- Airflow Failure
- Filter Change
- Phase Failure (Option)
- Emergency Stop (Option)
- Circuit 1 Low Pressure
- Circuit 2 Low Pressure
- Compressor 1 Status
- Compressor 2 Status
- Evaporator Fan 1 Trip
- Evaporator Fan 2 Trip
- Gas Burner Fault (Gas Fired Heating Option)
- Return Air Fan Trip (Return Air Fan Option)
- Circuit 1 Outdoor Fan Trip
- Circuit 2 Outdoor Fan Trip

ALARM LOG

The controller logs and allows viewing of the last 100 conditions recorded in descending chronological order through the keypad display

AIRETronix Controls

STANDARD FEATURES

Unit Remote ON/OFF	Disables/Enables the unit remotely.
Emergency Stop	Disable unit in the event of an emergency.
Phase Failure	Disable unit in the event of phase loss or incorrect phase rotation.
Compressor Anti Cycle Control	Automatic via the Microprocessor.
Compressor Hours Run	Displays hours run of each compressor.
System Temperature & Pressure Monitoring	Displays evaporating pressure/temperature, condensing pressure/temperature and superheat.
Password Protection	The control system integrity can be maintained by restricting access with a password PIN number.

CAUTION

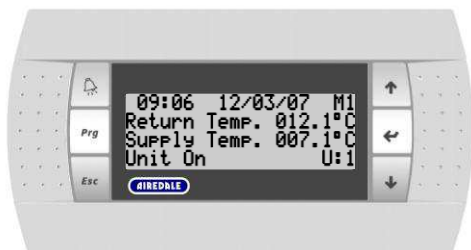


IMPORTANT: To change the PIN number; please contact Airedale at time of order with the preferred 4 digit number.

AIRETronix Controls

OPTIONAL FEATURES

Remote Display Keypad Available for remote wall mounting in a weatherproof environment such as a plant room:



BMS Interface Card

Enables **AIRETronix** Controlled units to be interfaced with most BMS, factory fitted, please contact Airedale.

A wide range of protocols can be accommodated through the use of interface devices. Available as a standard option are: ModBus/Jbus, Carel and Trend.

For interfaces such as SNMP, LonWorks, Metasys and BACnet, please contact Airedale.

Also available is Airedale's own supervisory plug-in BMS card pCOWEB.

Based on Ethernet TCP/IP secure technology with SNMP features.

Requires no proprietary cabling or monitoring software and supplied pre programmed with an IP address for ease of set up.

GSM Modem Kit

Allows remote alarm monitoring by sending alarm text messages to a nominated mobile phone, factory set.

Networking

A Local Area Network (**AIRELan**) can be used to connect upto 6 units to offer intercommunication and Duty/Standby control. This also allows the connection of computers, printers and modems on the same communications ring. For further details, please contact Airedale Controls.

CAUTION  **When adding to an existing network, please consult Airedale to ensure strategy compatibility.**

Performance Data

CAPACITY DATA - COOLING ONLY UNIT

DX (Mechanical) Cooling Only

	Air On °C DB / %RH	Ambient														
		20°C			25°C			30°C			35°C			40°C		
		TC kW	SC kW	EER	TC kW	SC kW	EER	TC kW	SC kW	EER	TC kW	SC kW	EER	TC kW	SC kW	EER
STM50R-P	20 / 50	54.3	51.6	3.9	52.5	49.9	3.5	50.4	48.1	3.1	48.2	46.1	2.8	45.9	44.0	2.4
	22 / 50	56.9	52.0	4.1	55.0	50.4	3.7	52.8	48.7	3.3	50.5	46.8	2.9	48.1	44.7	2.5
	24 / 50	59.5	52.1	4.2	57.5	50.6	3.8	55.3	49.0	3.4	53.0	47.2	3.0	50.5	45.3	2.6
	26 / 50	62.3	51.9	4.4	60.3	50.4	3.9	58.1	48.9	3.5	55.7	47.2	3.1	53.0	45.3	2.7
STM77R-P	20 / 50	80.2	77.1	3.7	77.4	74.5	3.3	74.1	71.6	3.0	70.6	68.4	2.6	66.6	64.8	2.2
	22 / 50	83.8	78.1	3.9	80.8	75.6	3.5	77.4	72.9	3.1	73.7	69.8	2.7	69.7	66.4	2.3
	24 / 50	87.9	79.0	4.0	84.8	76.7	3.6	81.3	74.0	3.2	77.5	71.1	2.8	73.2	67.8	2.4
	26 / 50	92.1	79.2	4.2	88.8	77.0	3.7	85.2	74.5	3.3	81.1	71.7	2.9	76.5	68.6	2.5

TC = Total Cooling SC = Sensible Cooling EER = Energy Efficiency Ratio

- (1) Figures are Gross.
- (2) Energy Efficiency Ratio (EER) is Total Cooling duty ÷ Unit Input Power, where input power includes compressor, supply fan and condenser fan.

Free Cooling Only

	Air On °C DB / %RH	Ambient							
		10°C		15°C		20°C		25°C	
		TC kW	EER	TC kW	EER	TC kW	EER	TC kW	EER
STM50R-P	20 / 50	36.7	19.3	18.4	9.7	-	-	-	-
	22 / 50	44.1	23.2	25.7	13.5	7.3	3.9	-	-
	24 / 50	51.4	27.1	33.0	17.4	14.7	7.7	-	-
	26 / 50	58.8	30.9	40.4	21.3	22.0	11.6	3.7	1.9
STM77R-P	20 / 50	67.3	18.7	33.7	9.4	-	-	-	-
	22 / 50	80.8	22.4	47.1	13.1	13.5	3.7	-	-
	24 / 50	94.2	26.2	60.6	16.8	26.9	7.5	-	-
	26 / 50	107.7	29.9	74.1	20.6	40.4	11.2	6.7	1.9

TC = Total Cooling SC = Sensible Cooling EER = Energy Efficiency Ratio

- (1) Figures are Gross. i.e. $Q = m C_p \Delta T$
- (2) Energy Efficiency Ratio (EER) is Total Cooling duty ÷ Unit Input Power, where input power includes compressor and supply fan.

OPERATING LIMITS

Unit with Electronic Fan Speed HP Control (-20°C)	
Minimum Ambient Air DB°C	-20°C
Maximum Ambient Air DB°C	+40°C

For applications outside of these conditions, please refer to Airedale.

Performance Data

CAPACITY DATA - COOLING & HEAT PUMP UNIT

DX (Mechanical) Cooling - (Heat Pump)

	Air On °C DB / %RH	Ambient														
		20°C			25°C			30°C			35°C			40°C		
		TC kW	SC kW	EER	TC kW	SC kW	EER	TC kW	SC kW	EER	TC kW	SC kW	EER	TC kW	SC kW	EER
STM50RHP-P	20 / 50	54.2	51.2	3.9	52.4	49.6	3.5	50.4	47.8	3.1	48.2	45.9	2.8	45.9	43.8	2.4
	22 / 50	56.8	51.4	4.1	54.9	49.9	3.7	52.8	48.2	3.3	50.5	46.4	2.9	48.1	44.4	2.5
	24 / 50	59.2	51.2	4.2	57.3	49.7	3.8	55.1	48.2	3.4	52.8	46.5	3.0	50.3	44.7	2.6
	26 / 50	61.9	50.6	4.4	60.0	49.4	3.9	57.9	48.0	3.5	55.6	46.4	3.1	53.0	44.7	2.7
STM77RHP-P	20 / 50	78.5	75.3	3.7	75.9	72.9	3.3	73.0	70.2	2.9	69.7	67.3	2.5	66.2	64.0	2.2
	22 / 50	81.9	76.1	3.8	79.2	73.9	3.4	76.1	71.3	3.0	72.7	68.4	2.6	68.9	65.2	2.3
	24 / 50	86.0	77.1	3.9	83.2	75.1	3.5	80.1	72.6	3.1	76.5	69.9	2.7	72.4	66.7	2.4
	26 / 50	89.1	76.8	4.0	86.4	74.9	3.6	83.2	72.8	3.2	79.5	70.2	2.8	75.2	67.2	2.5

TC = Total Cooling SC = Sensible Cooling EER = Energy Efficiency Ratio

- Figures are Gross.
- Energy Efficiency Ratio (EER) is Total Cooling duty ÷ Unit Input Power, where input power includes compressor, supply fan and condenser fan.

DX (Mechanical) Heating - (Heat Pump)

	Air On °C DB / %RH	Ambient											
		-10°C		-5°C		0°C		5°C		10°C		15°C	
		THR kW	EER	THR kW	EER	THR kW	EER	THR kW	EER	THR kW	EER	THR kW	EER
STM50RHP-P	20 / 50	34.0	2.1	42.3	2.4	49.9	2.7	56.5	2.9	62.9	3.1	68.8	3.2
	22 / 50	34.1	2.0	42.4	2.3	50.0	2.6	56.5	2.8	62.8	2.9	68.5	3.1
	24 / 50	34.3	2.0	42.5	2.3	50.1	2.5	56.4	2.6	62.6	2.7	67.8	2.8
	26 / 50	34.5	1.9	42.6	2.2	50.1	2.4	56.4	2.6	62.7	2.8	68.3	3.0
STM77RHP-P	20 / 50	45.6	2.1	56.0	2.4	64.4	2.6	73.2	2.9	81.3	3.1	90.3	3.3
	22 / 50	45.9	2.0	56.3	2.3	64.9	2.6	73.6	2.8	81.6	3.0	90.4	3.1
	24 / 50	46.3	1.9	56.7	2.2	65.3	2.5	73.9	2.7	81.9	2.9	90.6	3.0
	26 / 50	46.7	1.9	57.1	2.2	65.8	2.4	74.3	2.6	82.2	2.8	90.6	2.9

THR = Total Heat Rejection EER = Energy Efficiency Ratio

- Figures are Nett. Includes supply fan heat gains.

Free Cooling (Cooling Only & Heat Pump)

	Air On °C DB / %RH	Ambient							
		10°C		15°C		20°C		25°C	
		TC kW	EER	TC kW	EER	TC kW	EER	TC kW	EER
STM50R-P	20 / 50	36.7	19.3	18.4	9.7	-	-	-	-
	22 / 50	44.1	23.2	25.7	13.5	7.3	3.9	-	-
	24 / 50	51.4	27.1	33.0	17.4	14.7	7.7	-	-
	26 / 50	58.8	30.9	40.4	21.3	22.0	11.6	3.7	1.9
STM77R-P	20 / 50	67.3	18.7	33.7	9.4	-	-	-	-
	22 / 50	80.8	22.4	47.1	13.1	13.5	3.7	-	-
	24 / 50	94.2	26.2	60.6	16.8	26.9	7.5	-	-
	26 / 50	107.7	29.9	74.1	20.6	40.4	11.2	6.7	1.9

TC = Total Cooling SC = Sensible Cooling EER = Energy Efficiency Ratio

- Figures are gross. i.e. $Q = m C_p \Delta T$
- Energy Efficiency Ratio (EER) is Total Cooling duty ÷ Unit Input Power where input power includes compressor and supply fan.

Performance Data

FAN PERFORMANCE - SUPPLY AIR

Input voltage signal

The input voltage signal to the fan speed controller from the unit microprocessor (Vdc) sets the fan speed for design performance.

The voltage can be determined from the graphs at design air volume using the Total Static Pressure:

$$TP = ISP + ESP$$

Where:

TP = Total static pressure

ISP = Internal Unit static pressure at 0Pa ESP

ESP = External static pressure at design conditions

Internal static pressure

The IP at 0Pa ESP can be determined at design air volume using the system lines provided on the graphs. 3 lines are shown on the graph representing the different internal system pressure characteristics for each heating option:

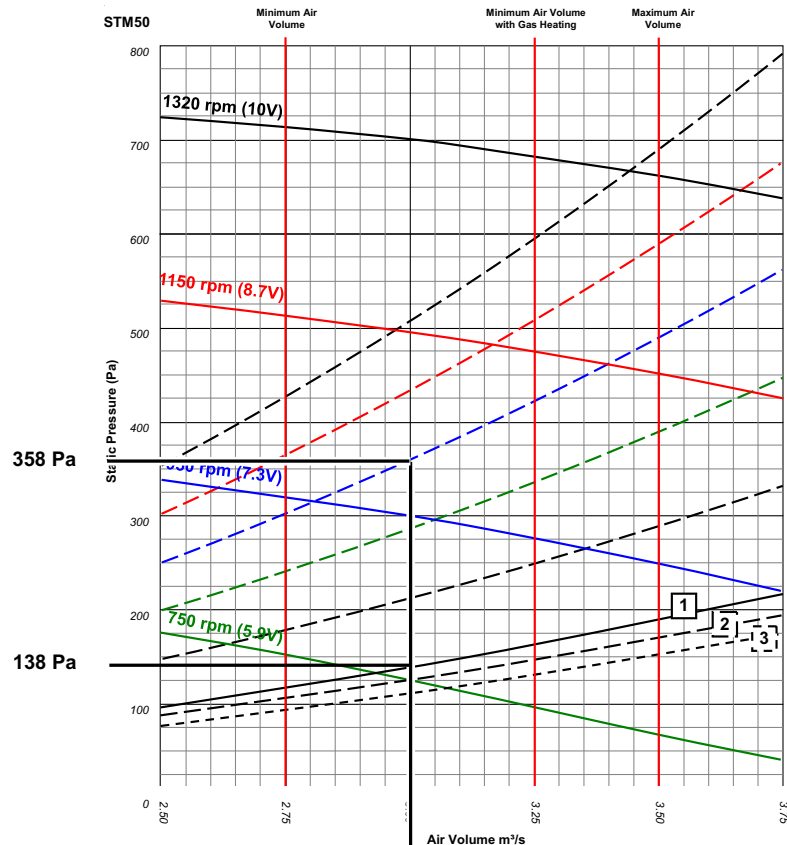
- 1 = 0Pa ESP with gas fired heating
- 2 = 0Pa ESP with LPHW/Electric heating
- 3 = 0Pa ESP cooling only

Select the correct internal system line for the chosen design.

Example

STM50R

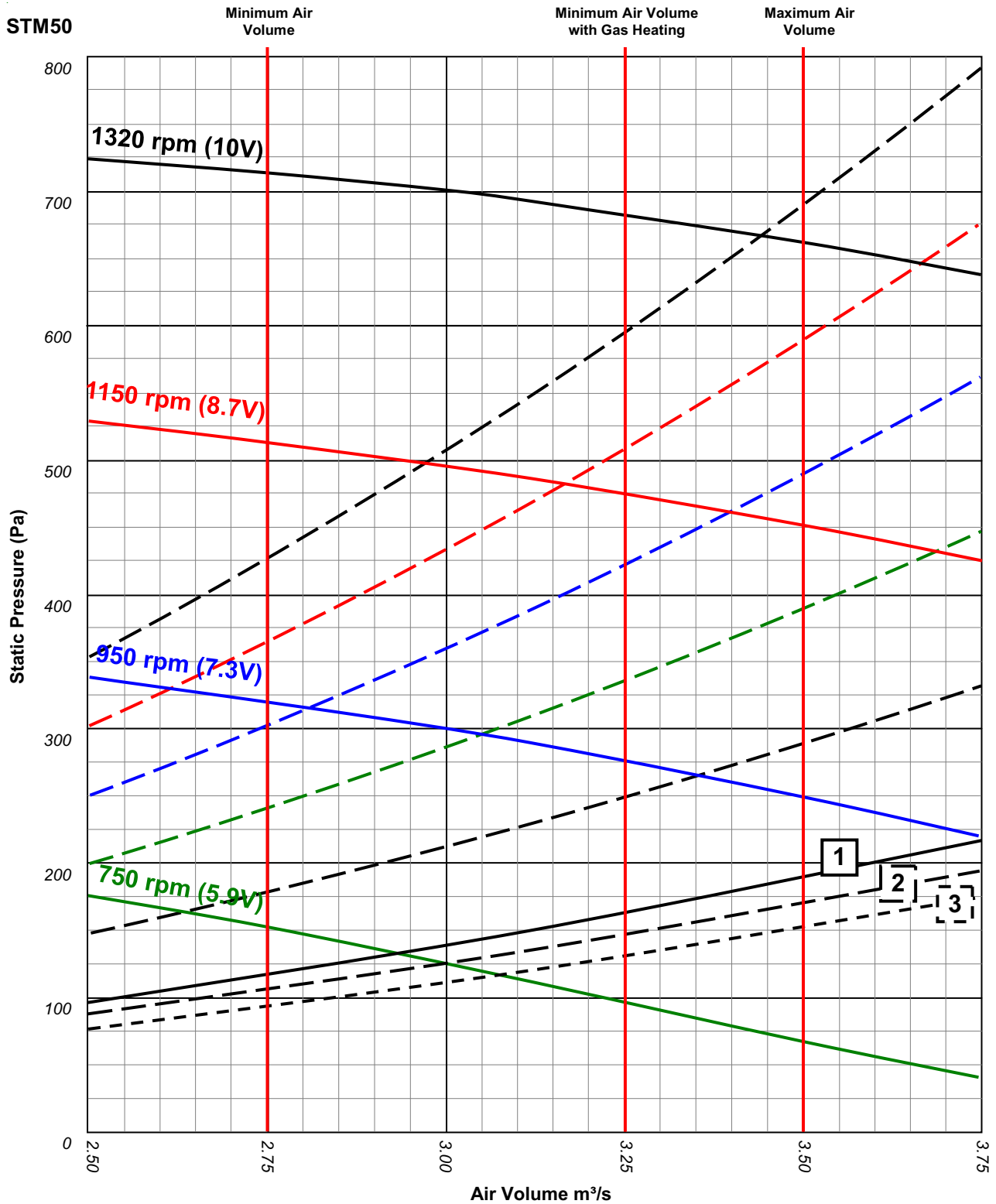
Air volume, design	= 3.0 m ³ /s
External static pressure, design	= 120 Pa
Internal static pressure, from graph	= 138 Pa with gas fired heating
Total static pressure, calculate	= 120 + 138 = 358 Pa
Input signal voltage, from graph	= 1030 rpm (7.8 V)



Performance Data

FAN PERFORMANCE - SUPPLY AIR

STM50

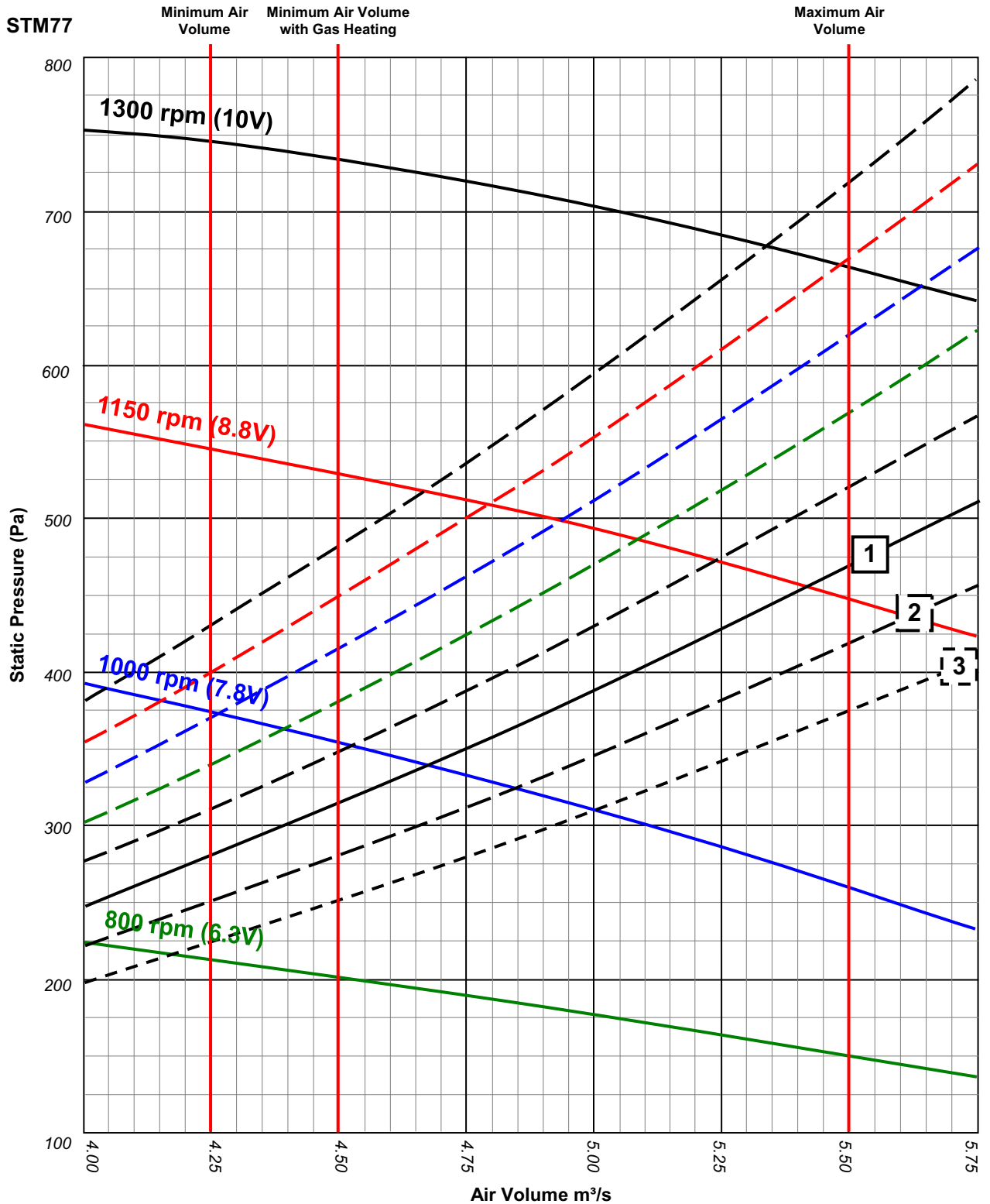


- Key:**
- 1 = 0 Pa ESP - Gas Fired Heating
 - 2 = 0 Pa ESP - LPHW/Electric Heating
 - 3 = 0 Pa ESP - Cooling Only

Performance Data

FAN PERFORMANCE - SUPPLY AIR

STM77



- Key:
- 1 = 0 Pa ESP - Gas Fired Heating
 - 2 = 0 Pa ESP - LPHW/Electric Heating
 - 3 = 0 Pa ESP - Cooling Only

Performance Data

FAN PERFORMANCE - RETURN AIR

Input voltage signal The input voltage signal to the fan speed controller from the unit microprocessor (Vdc) sets the fan speed for design performance.

The voltage can be determined from the graphs at design air volume using the Total Static Pressure:

$$TP = IP + ESP$$

Where:

- TP = Total static pressure
- IP = Internal unit static pressure at 0Pa ESP
- ESP = External static pressure at design conditions

Internal static pressure The IP at 0Pa ESP can be determined at design air volume using the system lines provided on the graphs:

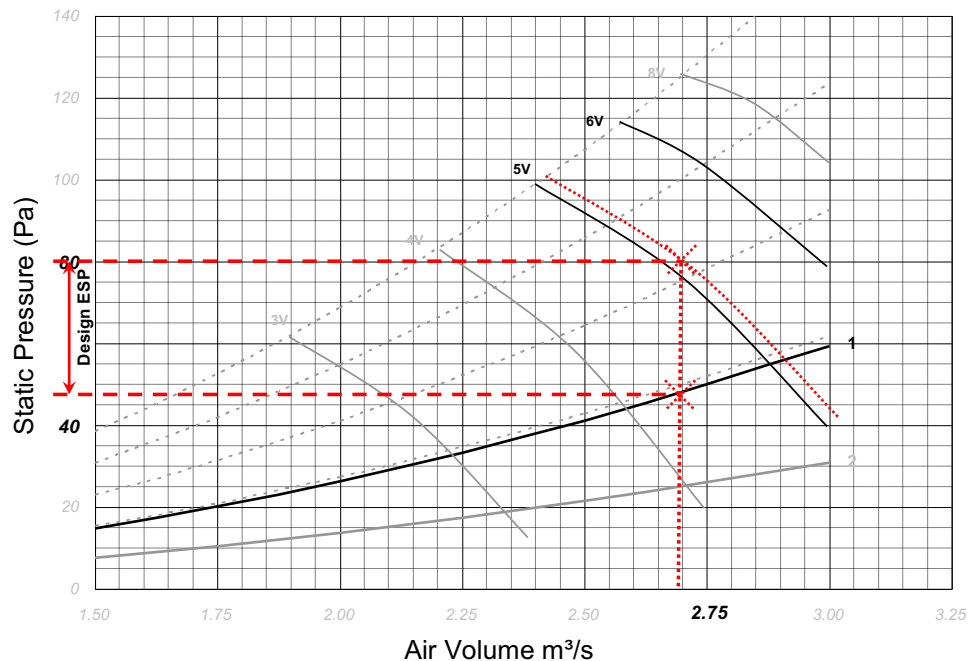
- 1 = 0 Pa ESP - 100% Free Cooling
- 2 = 0 Pa ESP - 0% Free Cooling

Select the correct internal system line for the chosen design, (recommended design set up at 100% free cooling operation).

Example

STM50

- Air volume, design = 2.7 m³/s
- External static pressure, design = 32 Pa
- Internal static pressure, from graph = 48 Pa at 100% free cooling
- Total static pressure, calculate = 32 + 48 = 80 Pa
- Input signal voltage, from graph = 5.1 V



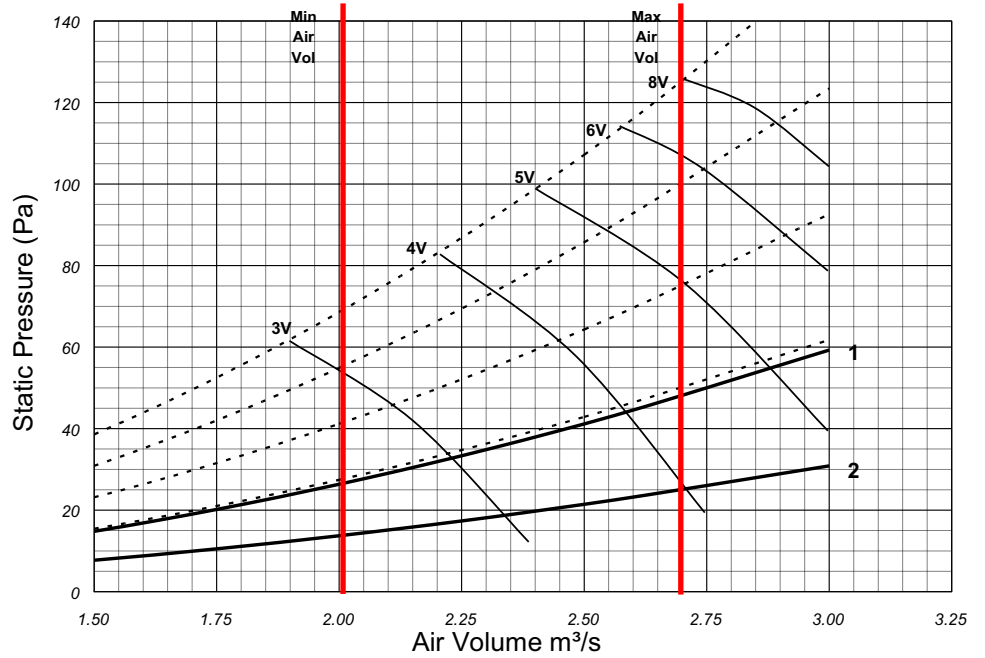
Design Return Air Volume

In line with current building guidelines on air quality, the return air volume has been designed to provide a maximum of 90% of the supply air volume, thus ensuring a constant 10% fresh air demand.

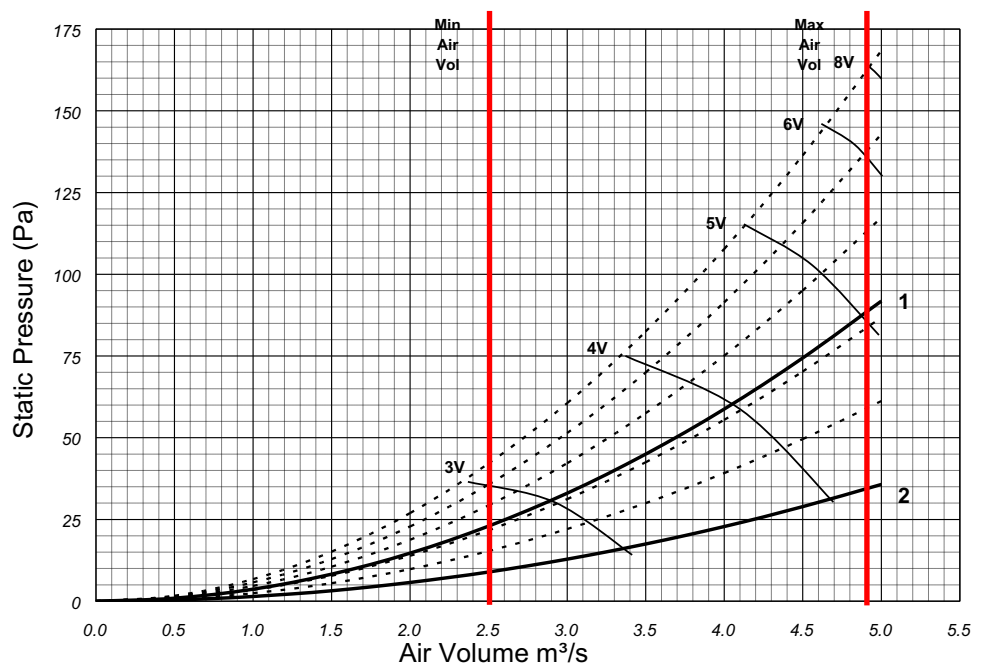
Performance Data

FAN PERFORMANCE - RETURN AIR

STM50



STM77



Key: 1 = 0 Pa ESP - 100% Free Cooling
 2 = 0 Pa ESP - 0% Free Cooling

Sound Data

MEASUREMENT OF SOUND DATA

All sound data quoted has been measured in the third-octave band limited values, using a Real Time Analyser calibrated sound intensity meter in accordance with BS EN ISO9614 Part 1 : 1995.

All Sound Power Levels quoted are calculated from measured sound intensity according to BS EN ISO9614 Part 1 : 1995.

Sound Pressure Levels are calculated from sound power using the hemispherical method according to BS EN ISO11203 : 1996.

SOUND DATA

Split System - Evaporator Section Only - DX (Mechanical) Cooling - Case Breakout

	Sound Measurement	Overall dB(A)	Frequency (Hz) dB							
			63	125	250	500	1000	2000	4000	8000
STM50	Power	72	54	71	73	69	69	62	54	47
	Pressure @ 10m	44	26	43	45	41	41	34	26	19
STM77	Power	74	55	73	74	72	70	63	55	51
	Pressure @ 10m	46	27	45	46	44	42	35	27	23

Split System- Condenser Section Only - DX (Mechanical) Cooling - Case Breakout

	Sound Measurement	Overall dB(A)	Frequency (Hz) dB							
			63	125	250	500	1000	2000	4000	8000
STM50	Power	78	52	65	68	71	73	73	66	55
	Pressure @ 10m	50	24	37	40	43	45	45	38	27
STM77	Power	78	52	65	68	71	73	73	66	55
	Pressure @ 10m	50	24	37	40	43	45	45	38	27

Packaged System - DX (Mechanical) Cooling - Case Breakout

	Sound Measurement	Overall dB(A)	Frequency (Hz) dB							
			63	125	250	500	1000	2000	4000	8000
STM50	Power	79	56	72	74	73	74	73	66	56
	Pressure @ 10m	51	28	44	46	45	46	45	38	28
STM77	Power	79	57	74	75	75	75	73	66	56
	Pressure @ 10m	51	29	46	47	47	47	45	38	28

In-Duct Sound Data

	Sound Measurement	Overall dB(A)	Frequency (Hz) dB							
			63	125	250	500	1000	2000	4000	8000
STM50	Return air power	83	77	77	80	77	78	78	74	67
	Supply air power	78	72	85	83	74	71	68	64	60
STM77	Return air power	79	75	77	79	77	73	70	66	61
	Supply air power	83	76	87	84	77	77	74	70	70

- 1 dB(A) is the overall sound level, measured on the A scale.
- 2 Above sound levels are with the condenser fan running at full speed.
- 3 Return air sound levels are based on nominal design air volume with maximum external static pressure 75Pa
- 2 Supply air sound levels are based on nominal design air volume with maximum external static pressure 250Pa



The Sound Pressure data quoted is only valid in free field conditions, where the unit is installed on a reflective base. If the equipment is placed adjacent to a reflective wall, values may vary to those stated, typically increasing by 3dB for each side added.

General Specification

MECHANICAL DATA - COOLING ONLY

		STM50R	STM77R
Duty - Cooling			
Nom Cooling (Gross) Total	(1) kW	53.0	77.5
Nom Cooling (Gross) Sensible	(1) kW	47.2	71.1
Fan Gains - Supply per unit	(1) kW	1.52	2.88
EER - DX (Mechanical) Cooling	(2)	2.99	2.79
EER - Free Cooling	(3)	12.8	14.3
Capacity Steps	%	0, 50 & 100	0, 50 & 100
Dimensions - H x W x L			
Packaged Unit	mm	2140 x 1900 x 4500	2140 x 1900 x 4500
Weights			
Operating - Packaged Unit	(4) kg	1987	2003
Construction - Material / Colour			
Galvanised Sheet Steel, Epoxy Baked Powder Paint - Light Grey (RAL 7035)			
Evaporator			
Cross Hatch Copper Tube/ Hydrophilic Fins - Air Cooled			
Face Area (Total)	m ²	2.275	2.275
Condenser			
Cross Hatch Copper Tube/ Hydrophilic Fins - Air Cooled			
Face Area (Total)	m ²	2.270	2.270
Fan & Motor - Evaporator			
Backward Curved Impeller - EC Plug Fan			
Quantity / Motor Size	kW	2 x 1.9	2 x 3.6
Diameter	mm	560	630
Air Volume	m ³ /s	3.0	5.5
Maximum External Static	Pa	470	200
Fan & Motor - Condenser			
Axial Fan			
Quantity / Motor Size	kW	2 x 0.98	2 x 0.98
Diameter	mm	710	710
Air Volume	m ³ /s	7.7	7.7
Compressor			
Tandem Scroll - Hermetic			
Quantity		2	2
Oil Charge Volume (Total)	l	6.6	6.6
Oil Type		Polyol Ester	
Refrigeration			
Refrigerant Control			
Single Circuit			
Refrigerant Precharged (Packaged)			
Electronic Expansion Valve			
R410A			
Charge (Total)	kg	23.1	26.2
Connections			
Condensate Drain			
Condensate Drain	in	1	1
Filtration			
Disposable to BS EN 779 - G4 - 97mm			
Quantity		6	6
OPTIONAL EXTRAS			
Gas Fired Heating (Indirect)			
Copper Tube/Aluminium Fin			
Gas Consumption - Nat.gas G20	(5) m ³ /h	90.0	90.0
Gas Connection	(6) Rc	10.68	10.68
Flue Diameter	mm	1 1/4	1 1/4
Maximum Equivalent Flue Length	(7) m	130	130
		9	9
Electric Heating			
Rating	kW	72.0	84.0
Number of Stages		3	4
Low Pressure Hot Water			
Capacity Gross	(8) kW	70.0	94.0
Water Flow (Nominal)	l/s	1.57	2.10
Water Pressure Drop	Pa	35	57
LPHW Connection Sizes	mm	42	42
Fan - Return Air			
Short Case Axial Fan			
Quantity / Motor Size	kW	1 x 1.4	1 x 2.1
Air Volume	m ³ /s	2.70	4.95
Maximum Static Pressure	Pa	90	90
Split System			
Dimensions - H x W x L Evaporator	mm	2140 x 1900 x 3500	2140 x 1900 x 3500
Dimensions - H x W x L Condenser	mm	2056 x 1900 x 1000	2056 x 1900 x 1000
Weights Operating - Evaporator	(4) kg	1605	1617
Weights Operating - Condenser	kg	382	386
Liquid Line	in	7/8	1 1/8
Discharge Line	in	1 1/8	1 1/8
Condenser Section - Precharged R10A	kg	23.8	27.7
Evaporator Section - Holding Charge		Inert Gas	

- (1) Nominal Cooling Duties based on 24°Cdb/50%RH and 35°C ambient
- (2) EER is Total Cooling duty ÷ Unit Input Power (DX (mechanical) cooling), where input power includes compressor, supply fan and condenser fan.
- (3) EER is Total Cooling duty ÷ Unit Input Power (100% free cooling), where input power includes compressor and supply at air on at 13°C ambient
- (4) Includes gas fired heater, return air fan and weather louvres.
- (5) Natural gas G20-Calorific value 10.48kWh/m³ GCV.
- (6) Gas supply line size Rc 1-1/4"
- (7) For internal applications reduce flue length by 1.5m for each 90° elbow and 0.75m for every 45° elbow.
- (8) Based upon low pressure hot water 82°C inlet/71°C outlet. Air on 20°C.

General Specification

MECHANICAL DATA - COOLING & HEAT PUMP

		STM50RHP	STM77RHP
Duty - Cooling			
Nom Cooling (Gross) Total	(1) kW	52.8	76.5
Nom Cooling (Gross) Sensible	(1) kW	46.5	69.9
EER - DX (Mechanical) Cooling	(2)	2.99	2.74
EER - Free Cooling	(3)	12.8	14.3
Fan Gains - Supply per unit	(1) kW	1.52	2.88
Capacity Steps	%	0, 50 & 100	0, 50 & 100
Duty - Heating			
Nom Heating (Nett) Total	(4) kW	56.5	73.6
EER - DX Heating	(5)	2.8	2.8
Dimensions - H x W x L			
Packaged Unit	mm	2140x 1900 x 4500	2140x 1900 x 4500
Weights			
Operating - Packaged Unit	(6) kg	2146	2150
Construction - Material / Colour			
Galvanised Sheet Steel, Epoxy Baked Powder Paint - Light Grey (RAL 7035)			
Evaporator			
Face Area (Total)	m ²	Interlaced Dual Circuit Cross Hatch Copper Tube/ Hydrophilic Fins - Air Cooled 2.275	2.275
Condenser			
Face Area (Total)	m ²	Interlaced Dual Circuit Cross Hatch Copper Tube/ Hydrophilic Fins - Air Cooled 2.270	2.270
Fan & Motor - Evaporator			
Quantity / Motor Size	kW	2 x 1.9	2 x 3.6
Diameter	mm	560	630
Air Volume	m ³ /s	3.0	5.5
Maximum External Static	Pa	470	200
Fan & Motor - Condenser			
Quantity / Motor Size	kW	2 x 0.98	2 x 0.98
Diameter	mm	710	710
Air Volume	m ³ /s	7.7	7.7
Compressor			
Quantity		2	2
Oil Charge Volume (Total)	l	2 x 3.3	2 x 3.3
Oil Type		Polyol Ester	
Refrigeration			
Refrigerant Control		Dual Circuit Electronic Expansion Valve	
Refrigerant Precharged (Packaged)		R410A	
Charge (Total)	kg	2 x 17.0	2 x 18.2
Connections			
Condensate Drain	in	1	1
Filtration			
Quantity		Disposable to BS EN 779 - G4 - 97mm 6	
OPTIONAL EXTRAS			
Gas Fired Heating (Indirect)			
Gas Consumption - Nat.gas G20	(7) kW	90.0	90.0
Gas Connection	(8) m ³ /h	10.68	10.68
Flue Diameter	(8) Rc	1 1/4	1 1/4
Maximum Equivalent Flue Length	(9) mm	130	130
	m	9	9
Electric Heating			
Rating	kW	24	36
Number of Stages		2	3
Low Pressure Hot Water			
Capacity Gross	kW	N/A	N/A
Water Flow (Nominal)	l/s	N/A	N/A
Water Pressure Drop	Pa	N/A	N/A
LPHW Connection Sizes	mm	N/A	N/A
Fan - Return Air			
Quantity / Motor Size	kW	1 x 1.4	1 x 2.1
Air Volume	m ³ /s	2.70	4.95
Maximum Static Pressure	Pa	90	90
Split System			
Dimensions - H x W x L Evaporator	mm	2140 x 1900 x 3500	2140 x 1900 x 3500
Dimensions - H x W x L Condenser	mm	2126 x 1900 x 1000	2126 x 1900 x 1000
Weights Operating - Evaporator	(6) kg	1740	1742
Weights Operating - Condenser	kg	406	408
Liquid Line	in	5/8	7/8
Discharge Line	in	1 1/8	1 1/8
Condenser Section - Precharged R10A	kg	2 x 17.7	2 x 19.0
Evaporator Section - Holding Charge		Inert Gas	

- (1) Nominal Cooling Duties based on 24°Cdb/50%RH and 35°C ambient
- (2) EER is Total Cooling duty ÷ Unit Input Power (DX (mechanical) cooling), where input power includes compressor, supply fan and condenser fan.
- (3) EER is Total Cooling duty ÷ Unit Input Power (100% free cooling), where input power includes compressor and supply at air on at 13°C ambient
- (4) Nominal Heating Duties based on 22°Cdb/50%RH and 5°C ambient
- (5) EER is Total Heating duty ÷ Unit Input Power (DX heating), where input power includes compressor, supply fan and condenser fan.
- (6) Includes gas fired heater, return air fan and weather louvres.
- (7) Natural gas G20-Calorific value 10.48kWh/m³ GCV.
- (8) Gas supply line size Rc 1-1/4".
- (9) For internal applications reduce flue length by 1.5m for each 90° elbow and 0.75m for every 45° elbow.

General Specification

ELECTRICAL DATA - COOLING ONLY

(1)		STM50R	STM77R
Electrical Supply Data			
Mains supply	(2) V	400V / 3 PH / 50Hz	
Permanent supply	Vac	230V / 1 PH + N / 50Hz	
Control circuit	V	24vac/230vac	
Recommended mains fuse	A	50	80
Recommended permanent mains fuse (3)	A	16	16
Max mains incoming cable size	mm ²	35mm ² (direct to isolator)	35mm ² (direct to isolator)
Max permanent incoming cable size	mm ²	4mm ² terminals	
Nominal run amps	(4) A	39.5	56.4
Maximum start amps	(5) A	180.5	193.8
Evaporator Fan - Per Fan			
Quantity		2	2
Motor size	kW	1.9	3.6
Full load amps	A	3.1	5.9
Locked rotor amps	A	N/A	N/A
Type of start		Electronically Commutated	
Condensing Unit Fans - Per Fan (6)			
Quantity		2	2
Motor size	kW	0.88	0.88
Full load amps	A	1.65	1.65
Locked rotor amps	A	6.10	6.10
Type of start		Direct on line	
Compressors - Per Compressor			
Quantity		2	2
Motor size	kW	8.4	12.15
Nominal run amps	(4) A	15.0	20.66
Start amps	A	156	158
Oil heater rating	W	65	65
Type of start		Direct on line	
OPTIONAL EXTRAS			
Return air fan (7)			
Quantity		1	1
Plug fan motor	kW	1.4	2.1
Nominal run amps	A	2.7	5.8
Start amps	A	9.8	24
Electronic compressor soft start			
Nominal run amps	(4) A	15.0	20.66
Maximum start amps	(5) A	93.6	94.80
Recommended mains fuse	A	50	80
Electric heating (8)			
Stage of reheat		3	4
Number of elements		18	21
Rating of electric heating	kW	72	84
Recommended mains fuse	A	125	160
Max mains incoming cable size	mm ²	120mm ² (direct to isolator)	120mm ² (direct to isolator)
Current per phase	A	104	124

- (1) Packaged Unit - P - Basic Unit (No Options)
- (2) When a common supply is used, a neutral is required.
- (3) Recommended permanent mains fuse is 32A when either a gas burner or power socket is fitted to the unit.
- (4) Based on 7.2°C evaporating and 54.4°C condensing.
- (5) Starting Amps refers to direct on line connections.
- (6) Sub fused when the unit is supplied split.
- (7) For units with options, unit fuse size needs to be calculated from information provided. Sizes given relate to basic units.
- (8) For units with the electric heating option a separate 3 phase fused supply is required.

General Specification

ELECTRICAL DATA - HEAT PUMP

(1)		STM50RHP	STM77RHP
Electrical Supply Data			
Mains supply	(2) V	400V / 3 PH / 50HZ	
Permanent supply	Vac	230V / 1 PH + N / 50Hz	
Control circuit	V	24vac/230vac	
Recommended mains fuse	A	50	80
Recommended permanent mains fuse (3)	A	16	16
Max mains incoming cable size	mm ²	35mm ² (direct to isolator)	35mm ² (direct to isolator)
Max permanent incoming cable size	mm ²	4mm ² terminals	
Nominal run amps	(4) A	43.0	59.9
Maximum start amps	(5) A	184	197.3
Evaporator Fan - Per Fan			
Quantity		2	2
Motor size	kW	1.9	3.6
Full load amps	A	3.1	5.9
Locked rotor amps	A	N/A	N/A
Type of start		Electronically Commutated	
Condensing Unit Fans - Per Fan (6)			
Quantity		2	2
Motor size	kW	0.88	0.88
Full load amps	A	1.65	1.65
Locked rotor amps	A	6.1	6.1
Type of start		Direct on line	
Compressors - Per Compressor			
Quantity		2	2
Motor size	kW	8.4	12.15
Nominal run amps	(4) A	15	20.66
Start amps	A	156	158
Oil heater rating	W	65	65
Type of start		Direct on line	
OPTIONAL EXTRAS			
Return air fan (7)			
Quantity		1	1
Plug fan motor	kW	1.4	2.1
Nominal run amps	A	2.7	5.8
Start amps	A	9.8	24
Electronic compressor soft start			
Nominal run amps	(4) A	15	20.66
Maximum start amps	(5) A	93.6	94.8
Recommended mains fuse	A	50	80
Electric heating (8)			
Stage of reheat		2	3
Number of elements		6	9
Rating of electric heating	kW	24	36
Current per phase	A	34.7	52

(1) Packaged Unit - P - Basic Unit (No Options)

(2) When a common supply is used, a neutral is required.

(2) Recommended permanent mains fuse is 32A when either a gas burner or power socket is fitted to the unit.

(3) Based on 7.2°C evaporating and 54.4°C condensing.

(4) Starting Amps refers to direct on line connections.

(5) Sub fused when the unit is supplied split.

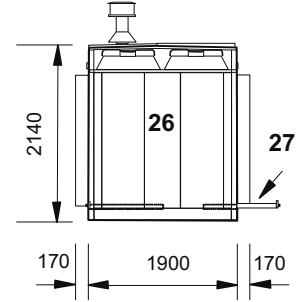
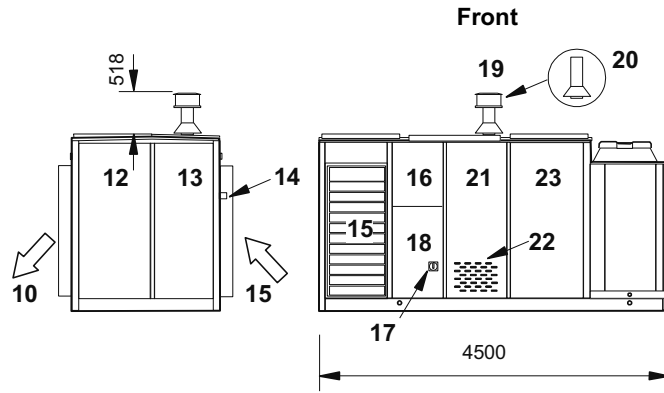
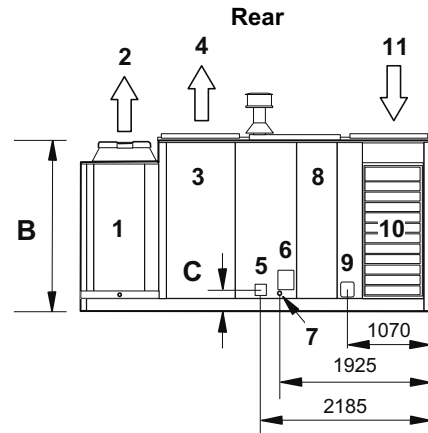
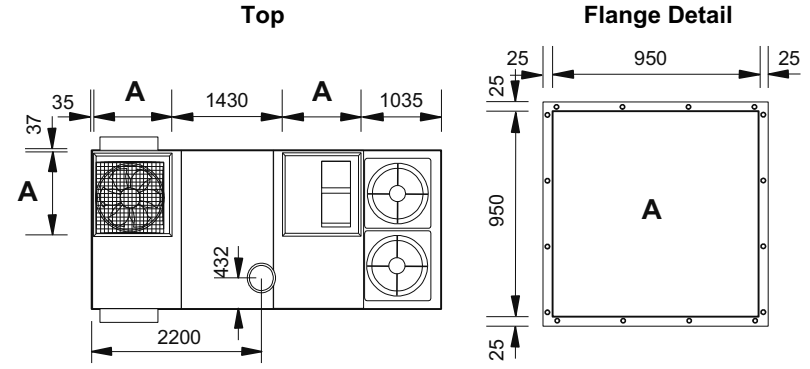
(6) For units with options, unit fuse size needs to be calculated from information provided. Sizes given relate to basic units.

(7) Electric heating to Heat Pumps is only supplementary.

Dimensional Data

PACKAGED UNIT (MM)

- A = Top Flange(s)
- B = Condenser Section Height:
 - Cooling Only Unit SM**R-P unit = 2056 mm
 - Cooling & Heat Pump SM**RHP-P unit = 2126 mm
- C = Gas Supply Inlet (Heating Option):
 - Cooling Only Unit SM**R-P unit = 275 mm
 - Cooling & Heat Pump SM**RHP-P unit = 420 mm

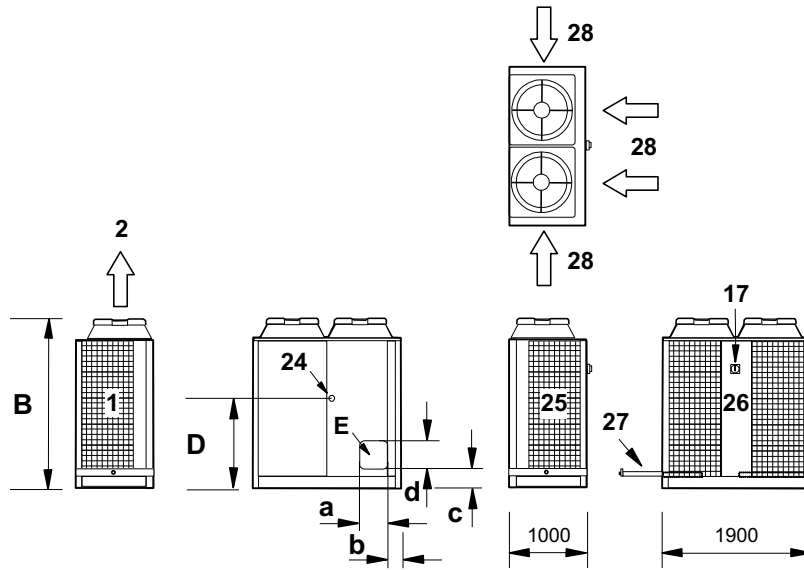


- 1 Condenser Coils
- 2 Condenser Fans & Airflow
- 3 Supply Air Fan & Heating Option Access
- 4 Supply Air Fan & Duct Flange
- 5 Cooling Only Blanking Plate or Heating Option:
Gas Supply Inlet
Electric Heater Electrical Mains Incoming
LPHW connections
- 6 Condensate Drain Tray / Inspection Cover
- 7 Condensate Drain
- 8 Filter Access
- 9 Unit Mains Incoming
- 10 Exhaust Air Outlet with Weather Louvre
- 11 Return Air Fan (Option) & Duct Flange
- 14 Ambient Sensor
- 15 Fresh Air Inlet with Weather Louvre
- 16 Controls - Control Panel
- 17 Mains Electric Isolator
- 18 Mains Electrics - Control Panel
- 19 Optional Gas Heating Exhaust Flue (130mm Dia.), with cowl required in OUTDOOR applications ONLY
- 20 Optional Gas Heating Exhaust Flue (130mm Dia), without cowl for INDOOR applications ONLY
- 21 Evaporator Coil & Heating Option Access
- 22 Gas Heating Air Inlet supplied with Gas Heating Option
- 23 Compressor Access
- 24 Condenser Mains Incoming Cable Entry (Split System)
- 25 Optional Condenser Coil Guards
- 26 Condenser Fan - Control Panel
- 27 Heat Pump Units ONLY: Condenser Coil section full width pull out condensate drain trays with central drain stub

12	Return Air Fan & Damper Actuator Access	28	Airflow
13	Mixed Air Chamber & Damper Actuator Access		

SPLIT SYSTEM

Condenser Section (mm)

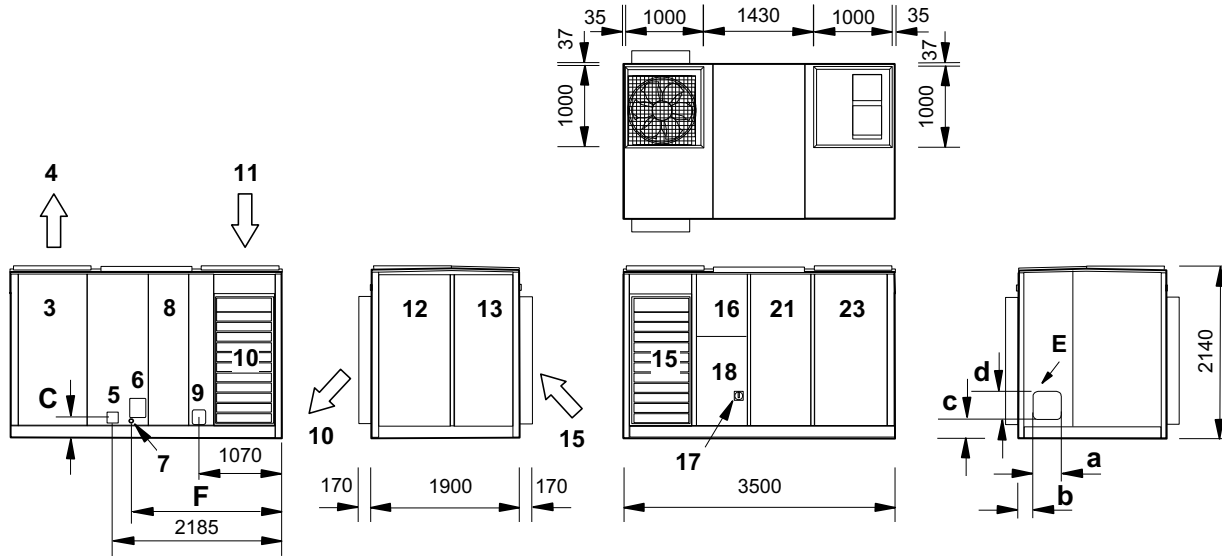


- B = Condenser Section Height:**
Cooling Only Unit SM**R-C unit = 2056 mm
Cooling & Heat Pump SM**RHP-C unit = 2126 mm
- C = Gas Supply Inlet (Heating Option):**
Cooling Only Unit SM**R-E unit = 243 mm
Cooling & Heat Pump SM**RHP-E unit = 420 mm
- D = Condenser Mains Incoming Cable Entry (Split System):**
Cooling Only Unit SM**R-C unit = 1125 mm
Cooling & Heat Pump SM**RHP-C unit = 1264 mm
- E = Split System Services Gland Plate:**
Cooling Only Unit includes Discharge and Liquid Line connections
Cooling & Heat Pump Unit includes Discharge, Liquid and Suction line connections

		a	b	c	d
SM**R-C	mm	360	165	250	360
SM**RHP-C	mm	560	165	250	560
SM**R-E	mm	360	165	250	360
SM**RHP-E	mm	360	165	250	360

- F = Condensate Drain:**
Cooling Only Unit SM**R-E unit = 1925 mm
Cooling & Heat Pump SM**RHP-E unit = 1975 mm

Evaporator Section (mm)



Installation Data


POSITIONING

The installation position should be selected with the following points in mind:

- Position on a stable and even base, levelled to ensure that the compressor operates correctly
- The minimum unit support can be provided by concrete/steel blocks of 300 x 300 wide by 150mm deep to each corner of the rigid steel base
- Levelling should be to +/- 5mm
- Observe airflow and maintenance clearances
- Pipework and electrical connections are readily accessible
- Where multiple units are installed, due care should be taken to avoid the discharge air from each unit adversely affecting other units in the vicinity
- Within a side enclosed installation, the Condenser fan MUST be higher than the enclosing structure
- Ensure there are no obstructions directly above the fans
- Allow free space above the fans to prevent air recirculation
- **Take particular care to ensure sufficient air circulation is available for units fitted with optional Indirect Gas Fired Heating**

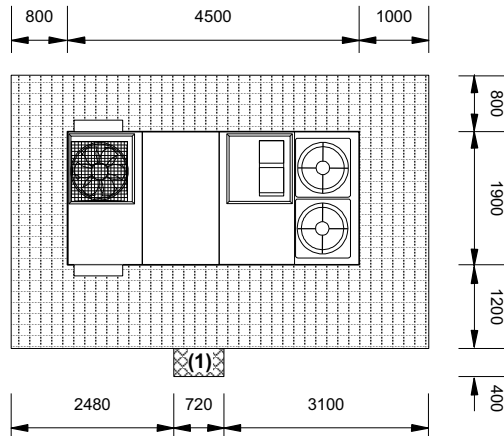
IMPORTANT  **Indirect Gas Fired Heating Option - As standard, configured suitable for outdoor application only, UNLESS otherwise stated at time of order.**

The unit **MUST** be checked prior to installation to ensure that it is correctly configured for the application. If necessary, instructions for conversion are supplied separately with the unit.

CAUTION  **Prior to connecting services, ensure that the equipment is installed and completely level.**

Packaged (mm)

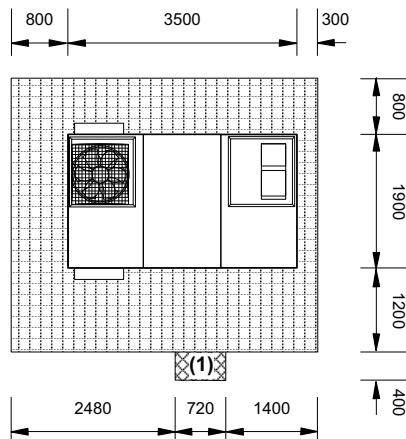
(1) Service area require for removal of coil



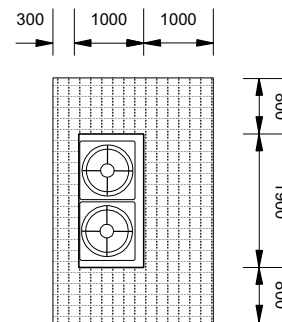
Split System (mm)

(1) Service area require for removal of coil

Evaporator Section




Condenser Section




Installation Data

UNIT LIFTING

- **Employ lifting specialists.**
- Local codes and regulations relating to the lifting of this type of equipment should be observed
- Use the appropriate spreader bars/lifting slings with the holes/lugs provided
- Attach individual lifting chains to each of the lifting eye bolts/lifting lugs provided; each individual chain must be capable of lifting the whole unit

IMPORTANT  **Do not use 1 chain between 2 lifting points to avoid load shift. Only use lifting points provided.**

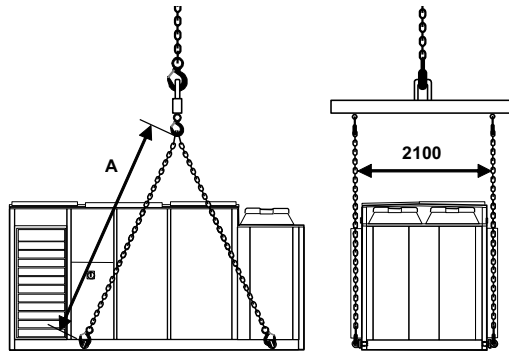
- Chains/slings **MUST NOT** interfere with the casing or fan assembly to avoid damage
- Lift the unit slowly and evenly

IMPORTANT  **If the unit is dropped, it should immediately be checked for damage and reported to Airedale.**

LIFTING DIMENSIONS

Packaged Unit (mm)

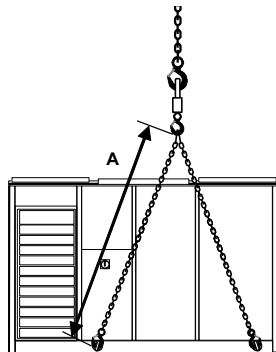
A = 3.5m Minimum



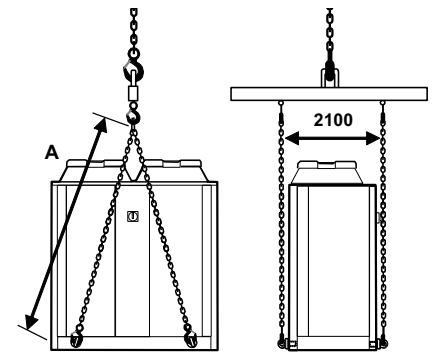
Split System (mm)

A = 3m Minimum

Evaporator Section



Condenser Section



WEIGHTS (KG)


		Packaged (No Options)	Evaporator Section	Condenser Section
STM50R	kg	1987	1605	382
STM77R	kg	2003	1617	386
STM50RHP	kg	2146	1740	406
STM77RHP	kg	2150	1742	408

Installation Data

SPLIT SYSTEM

Connecting Refrigerant Pipework Sizing Guide

Evaporator Section	Condenser Section	Equivalent Pipe Lengths with R410A In Cooling or Heat Pump Mode		
		Equivalent Length	Liquid	Discharge
SM50R-E	SM50R-C	0-15m	3/4"	1 1/8"
		15-40m	7/8"	1 3/8"
SM77R-E	SM77R-C	0-15m	7/8"	1 3/8"
		15-40m	7/8"	1 3/8"
SM50RHP-E	SM50RHP-C	0-15m	5/8"	1 1/8"
		15-40m	5/8"	1 1/8"
SM77RHP-E	SM77RHP-C	0-15m	5/8"	1 1/8"
		15-40m	3/4"	1 1/8"


IMPORTANT  **Liquid Line - The figures quoted are the recommended size for both cooling and heating mode liquid lines.**

Discharge Line - The discharge sizing recommendations quoted are also valid in heating mode when this line becomes the suction line.

Unit Refrigerant Charge

The **system** refrigerant charge is supplied in the **Condensing section** and is sufficient for approximately 5m of interconnecting pipework.

		R410A Pre charge	Amount of system charge required by Evaporator section		
SM50R-C	kg	23.8	SM50R-E	kg	14.0
SM77R-C	kg	27.7	SM77R-E	kg	16.8
SM50RHP-C	kg	2 x 17.7	SM50RHP-E	kg	2 x 11.1
SM77RHP-C	kg	2 x 19.0	SM77RHP-E	kg	2 x 12.4

IMPORTANT  **Charges quoted per circuit ie: Cooling units have 1 circuit
Heat Pumps units have 2 circuits**

Liquid Line Refrigerant Charge (kg/m)


The condensing section is supplied with the system refrigerant and sufficient for approximately 5m of interconnecting pipework. For every metre thereafter, the following table indicates the approximate additional refrigerant required, using R410A and assuming a liquid line temperature of 40°C.

Liquid Line (m)	kg/m
3/8"	0.05
1/2"	0.09
5/8"	0.15
3/4"	0.21
7/8"	0.30
1 1/8"	0.53

Example: STM50R

Liquid Line length 15m (- 5m) = 10m
 Liquid Line diameter = 3/4"
 Addition Refrigerant per metre = 0.21kg

ie: 10 x 0.21 = 2.1kg of additional refrigerant / per circuit.

IMPORTANT  **The pipe sizes/refrigerant charges quoted are for guidance only. It is the responsibility of the installing contractor/site engineer to check the pipe sizes/refrigerant charge are correct for each system installation and application.**

Split systems may require additional oil which should be added to the low side of each compressor.


Design should be in accordance with accepted refrigeration practice to ensure good oil return to the compressor(s) under all normal operating conditions.

Installation Data

ELECTRICAL

General

- As standard the equipment is designed for 400V, 3 phase, 3 wire 50Hz and a separate permanent 230V, 1 phase, 50Hz supply, to all relevant IEE regulations, British standards and IEC requirements
- The control voltage to the interlocks is 24V, always size the low voltage interlock and protection cabling for a maximum voltage drop of 2V
- Avoid large voltage drops on cable runs, particularly low voltage wiring

CAUTION  **A fused and isolated electrical supply of the appropriate phase, frequency and voltage should be installed.**

Wires should be capable of carrying the maximum load current under non-fault conditions at the stipulated voltage.

A separately fused, locally isolated, permanent single phase and neutral supply MUST BE FITTED for the compressor oil heater, evaporator trace heating and control circuits, FAILURE to do so will INVALIDATE WARRANTY.

CAUTION  **ALL work MUST be carried out by technically trained competent personnel.**

Installation Data

INTERCONNECTING WIRING

Cooling Only - Typical Example

Packaged Unit
&
Split System Evaporator
Section

STM..R-P & STM..R-E	L1	○	←	Mains incoming supply 400V / 3 PH / 50Hz	
	L2	○	←		
	L3	○	←		
	PE	○	←		
	L4	○	←	Separate Permanent Supply 230V / 1 PH +N / 50Hz (Option)	
	PE	○	←		
	502	○	→	Unit Remote On/Off 24VAC	
	505	○	←		
	502	○	→	Fire Shutdown	
	507	○	←		
	565	○	←	Volt Free Common Alarm Volt Free Alarm N/O Volt Free Alarm N/C	} Critical
	564	○	→		
	563	○	→		
	562	○	←	Volt Free Common Alarm Volt Free Alarm N/O Volt Free Alarm N/C	} Non-Critical
	561	○	→		
	560	○	→		
	500	○	←	Return Air Velocity (Option)	
	502	○	→		
	858	○	←		
	860	○	←	Space Sensor 1 (Option)	
861	○	←			
862	○	←	Space Sensor 2 (Option)		
853	○	←			
RX-/Tx-	○	↔	AIRELan Network Connections		
RX+/Tx+	○	↔			
GND	○	↔			

Split System Interconnecting
Wiring

STM..R-C & STM..R-E	216	○	→	Outgoing supply 400V/3PH/50Hz Connection to Condenser Fan 1
	217	○	→	
	218	○	→	
	PE	○	→	
	222	○	→	Outgoing supply 400V/3PH/50Hz Connection to Condenser Fan 2 (Inverter Control only)
	223	○	→	
	224	○	→	
	PE	○	→	
	527	○	←	Outdoor Fan status
	502	○	→	
	528	○	←	

Installation Data

INTERCONNECTING WIRING

Heat Pump - Typical Example

Packaged Unit
&
Split System Evaporator
Section

	L1	○	←		
	L2	○	←		
	L3	○	←	Mains incoming supply 400V / 3 PH / 50Hz	
	PE	○	←		
	L4	○	←		
	N1	○	←	Separate Permanent Supply 230V / 1 PH +N / 50Hz (Option)	
	PE	○	←		
	502	○	→	Unit Remote On/Off 24VAC	
	505	○	←		
	502	○	→	Fire Shutdown	
	507	○	←		
	565	○	←	} Critical	
	564	○	→		Volt Free Alarm N/O
	563	○	→		Volt Free Alarm N/C
STM..RHP-P & STM..RHP-E	562	○	←	} Non-Critical	
	561	○	→		Volt Free Alarm N/O
	560	○	→		Volt Free Alarm N/C
	500	○	←		
	502	○	→	Return Air Velocity (Option)	
	858	○	←		
	801	○	→		
	852	○	←	Remote Outdoor Temp/Hum Sensors (Option)	
	853	○	←		
	860	○	←		
	861	○	←	Space Sensor 1 (Option)	
	862	○	←		
	853	○	←	Space Sensor 2 (Option)	
	RX-/Tx-	○	↔		
	RX+/Tx+	○	↔	AIRELan Network Connections	
	GND	○	↔		

Split System Interconnecting
Wiring

	3	○	→	
	N	○	←	Outdoor Drip Tray Heaters
	216	○	→	
	217	○	→	
	218	○	→	Outgoing supply 400V/3PH/50Hz Connection to Condenser Fan 1
	PE	○	→	
STM..RHP-C & STM..RHP-E	222	○	→	
	223	○	→	
	224	○	→	Outgoing supply 400V/3PH/50Hz Connection to Condenser Fan 2
	PE	○	→	
	527	○	←	
	502	○	→	Outdoor Fan status
	528	○	←	
	840	○	←	
	841	○	←	Circuit 1 Outdoor Coil Temperature
	842	○	←	
	843	○	←	Circuit 2 Outdoor Coil Temperature

NOTES:



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